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LEVEL III

VOLUME IVA

SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS

FINAL REPORT OF BEARING STAKE TESTS

JANUARY THRU MARCH 1978

Volume IVA, Data Points 7, 8 and 9
Raw Data

9 JANUARY 1979

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NAVAL AIR DEVELOPMENT CENTER
WARMINSTER, PENNSYLVANIA 18974

UNDER CONTRACTS
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and
N62269-78-M-6884

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SANDERS ASSOCIATES, INC.
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VOLUME	
IA	Summary - Test Results
IB	Detailed Description, Test Results
II	Data Analysis Facility and Data Reduction Methodology
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<u>NOTE</u> ALI Plot Scales for Beamformed and Omni Data are <u>NOT</u> the same. SNR comparisons cannot be taken directly from plot comparisons.

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SUMMARY OF DATA (CONTINUED)

- OMNI NOISE LEVELS

19 JANUARY 1977 DATA POINT 1

290 Hz	+64.6	dBreμPa/1 Hz
295 Hz	+64.2	dBreμPa/1 Hz

19 JANUARY 1977 DATA POINT 2

290 Hz	+64.7	dBreμPa/1 Hz
295 Hz	+65.4	dBreμPa/1 Hz

7 FEBRUARY 1977 DATA POINT 3

140 Hz	+74.5	dBreμPa/1 Hz
290 Hz	+67.5	dBreμPa/1 Hz

7 FEBRUARY 1977 DATA POINT 4

140 Hz	+73.3	dBreμPa/1 Hz
290 Hz	+65.6	dBreμPa/1 Hz

7 FEBRUARY 1977 DATA POINT 5

140 Hz	+76.6	dBreμPa/1 Hz
290 Hz	+68.4	dBreμPa/1 Hz

7 FEBRUARY 1977			DATA POINT 6
140 Hz	+76.0	dBreμPa/1 Hz	
290 Hz	+68.9	dBreμPa/1 Hz	
8 FEBRUARY 1977			DATA POINT 7
140 Hz	+70.1	dBreμPa/1 Hz	
290 Hz	+62.2	dBreμPa/1 Hz	
15 MARCH 1977			DATA POINT 8
140 Hz	+67.3	dBreμPa/1 Hz	
290 Hz	+61.6	dBreμPa/1 Hz	
15 MARCH 1977			DATA POINT 9
140 Hz	+68.2	dBreμPa/1 Hz	
290 Hz	+65.2	dBreμPa/1 Hz	
16 MARCH 1977			DATA POINT 10
140 Hz	+74.2	dBreμPa/1 Hz	
290 Hz	+64.6	dBreμPa/1 Hz	
16 MARCH 1977			DATA POINT 11
140 Hz	+70.2	dBreμPa/1 Hz	
290 Hz	+62.2	dBreμPa/1 Hz	

- OMNI NOISE LEVELS

16 MARCH 1977 DATA POINT 12

140 Hz	+72.0	dBreμPa/1 Hz
290 Hz	+65.5	dBreμPa/1 Hz

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DATA POINT	OPERATIONAL DATA	AVG SIGNAL LEVEL dBV	AVG. NOISE LEVEL dBV	BANDWIDTH CORRECTION (BW CPS-1/2)	BANDWIDTH CONVERSION (+10 LOG BW)	ARRAY SENSITIVITY (-10 LOG N)	M^{Pa} CONVERSION	SNR	LINEAR PROCESSING CORRECTION	CORRECTED SNR
1	DATE: 1-19-77 TIME 15512									
	RANGE: 91 N.M. 290 HZ	-49.7	-56.7	-1.8	+15	+8	+100	7.0	-4.8	+2.2
	DEPTH: 1650 FM 296 HZ	-53.3	-57.1	-1.8	+15	+8	+100	3.8	-5.8	-2.0
2	DATE: 1-19-77 TIME: 11002									
	RANGE: 91 N.M. 290 HZ	-51.5	-56.6	-1.8	+15	+8	+100	5.0	-5.2	-.2
	DEPTH: 1650 FM 295 HZ	-51.2	-55.9	-1.8	+15	+8	+100	4.7	-5.4	-.7
3	DATE: 2-7-77 TIME: 09306									
	RANGE: 175 N.M. 140 HZ	-32.5	-45.7	-1.8	+10	+12	+100	13.2	-4.2	9.0
	DEPTH: 1900 FM 280 HZ	-38.6	-48.7	-1.8	+10	+8	+100	10.1	-4.3	5.6
4	DATE: 2-7-77 TIME: 10198									
	RANGE: 159 N.M. 140 HZ	-34.4	-46.9	-1.8	+10	+12	+100	12.5	-4.2	8.3
	DEPTH: 1900 FM 280 HZ	-39.6	-50.6	-1.8	+10	+8	+100	11.0	-4.2	6.9
5	DATE: 2-7-77 TIME: 15992									
	RANGE: 110 N.M. 140 HZ	-30.0	-43.5	-1.8	+10	+12	+100	13.5	-4.2	9.3
	DEPTH: 1900 FM 280 HZ	-37.1	-47.8	-1.8	+10	+8	+100	14.7	-4.2	10.5
6	DATE: 2-7-77 TIME: 24777									
	RANGE: 70 N.M. 140 HZ	-24.7	-44.2	-1.8	+10	+12	+100	19.5	-4.6	15.5
	DEPTH: 1900 FM 280 HZ	-27.0	-47.3	-1.8	+10	+8	+100	24.3	-4.0	20.3

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O M N I

DATA POINT	OPERATIONAL DATA	AVG. SIGNAL LEVEL dBV	AVG. NOISE LEVEL dBV	BAND-WIDTH CORRECTION (HCPS-1B)	BAND-WIDTH CONVERSION (TO 1 HZ)	ARRAY SENSITIVITY (TO 1B/μB)	μP_a CONVERSION (TO dB μPa)	SNR	LINEAR PROCESSING CORRECTION	CORRECTED SNR
7	DATE: 2-8-77 TIME: 0202Z									
	RANGE: 28 N.M. 140 HZ	-16.0	-50.1	-1.8	+10	+12	+100	34.1	-4.0	30.1
	DEPTH: 1800FM 290 HZ	-17.5	-59.0	-1.8	+10	+8	+100	36.5	-4.0	32.5
8	DATE: 3-15-77 TIME: 1501Z									
	RANGE: 22 N.M. 140 HZ	-19.4	-52.9	-1.8	+10	+12	+100	33.5	-4.0	29.5
	DEPTH: 2800FM 290 HZ	-15.2	-54.6	-1.8	+10	+8	+100	39.4	-4.0	35.4
9	DATE: 3-15-77 TIME: 2131Z									
	RANGE: 72 N.M. 140 HZ	-19.4	-52.0	-1.8	+10	+12	+100	36.6	-4.0	32.6
	DEPTH: 2800FM 290 HZ	-12.5	-51.0	-1.8	+10	+8	+100	38.5	-4.0	34.5
10	DATE: 3-16-77 TIME: 0633Z									
	RANGE: 139 N.M. 140 HZ	-23.3	-46.0	-1.8	+10	+12	+100	22.7	-4.0	18.7
	DEPTH: 2800FM 290 HZ	-38.0	-51.6	-1.8	+10	+8	+100	13.6	-4.2	9.4
11	DATE: 3-16-77 TIME: 0935Z									
	RANGE: 122 N.M. 140 HZ	-29.9	-50.0	-1.8	+10	+12	+100	20.2	-4.0	16.2
	DEPTH: 2800FM 290 HZ	-41.5	-54.0	-1.8	+10	+8	+100	12.5	-4.2	8.3
12	DATE: 3-16-77 TIME: 1148Z									
	RANGE: 133 N.M. 140 HZ	-24.8	-48.2	-1.8	+10	+12	+100	23.4	-4.0	19.4
	DEPTH: 2800FM 290 HZ	-38.6	-50.7	-1.8	+10	+8	+100	12.1	-4.2	7.9

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16 ELEMENT ARRAY

DATA	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCPC-32 COL CORRECTION	BEAM-SOURCE ATTN	BEAM-SOURCE CORRECTION	B+C	A+E	J+K	I+E	NOISE LEVEL dBV	MCPC-32 COL CORRECTION	BEAM-FORMER ATTN	BEAM-FORMER CORRECTION	BAND-WIDTH CORRECTION	BAND-WIDTH CORRECTION	ARRAY SENSITIVITY	APD POWER SUM	SNR H-F	LINEAR PROCESSING CORRECTION	CORRECTED SNR S+R	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	DATE [illegible] TIME [illegible] RANGE [illegible] 250 HZ	-44.4	+10	+18	+7	28	-32.9	28	-50.1	-78.1	+10	+18	+.9	-1.8	+15	+8	+100	17.7	-9.1	15.3	-39°	17.4
	DEPTH [illegible] 205 HZ	-68.8	+10	+17	+9	21	-46.8	28	-50.1	-78.1	+10	+18	+.9	-1.8	+15	+8	+100	9.3	-4.4	5.8	-38°	10.8
2	DATE [illegible] TIME [illegible] RANGE [illegible] 250 HZ	-37.1	NA	0	+9	0	-37.1	0	-44.0	-44.1	NA	0	+.9	-1.8	+15	+8	+100	7.5	-4.8	3.6	-56.5°	8.4
	DEPTH [illegible] 205 HZ	-38.7	NA	0	+9	0	-38.7	0	-44.6	-44.6	NA	0	+.9	-1.8	+15	+8	+100	5.9	-5.0	1.8	-58.5°	6.8
3	DATE [illegible] TIME [illegible] RANGE [illegible] 250 HZ	-31.2	+10	+18	+.2	28	-8.2	28	-31.8	-69.8	+10	+18	+.2	-1.8	+10	+12	+100	23.6	-4.0	19.8	35.5°	23.8
	DEPTH [illegible] 250 HZ	-41.6	+10	+18	+.9	28	-14.5	28	-39.8	-66.8	+10	+18	+.9	-1.8	+10	+8	+100	27.3	-4.0	20.1	35.5°	24.1
4	DATE [illegible] TIME [illegible] RANGE [illegible] 250 HZ	-39.5	+10	+18	+.2	28	-11.4	28	-27.1	-55.1	+10	+18	+.2	-1.8	+10	+12	+100	15.7	-4.0	11.7	33.5°	15.9
	DEPTH [illegible] 250 HZ	-44.2	+10	+18	+.6	28	-17.2	28	-37.9	-65.8	+10	+18	+.6	-1.8	+10	+8	+100	20.6	-4.0	17.2	35.5°	21.4
5	DATE [illegible] TIME [illegible] RANGE [illegible] 250 HZ	-29.0	+10	+18	+.2	28	-1.0	28	-33.1	-68.1	+10	+18	+.2	-1.8	+10	+12	+100	31.1	-6.0	22.3	48°	31.3
	DEPTH [illegible] 250 HZ	-38.9	+10	+18	+.9	28	-10.4	28	-36.8	-67.8	+10	+18	+.9	-1.8	+10	+8	+100	26.4	-4.0	23.3	48°	22.3
6	DATE [illegible] TIME [illegible] RANGE [illegible] 250 HZ	28.3	+10	+18	+.2	28	-.3	28	-28.3	-56.7	+10	+18	+.2	-1.8	+10	+12	+100	28	-4.0	24.2	17°	28.2
	DEPTH [illegible] 250 HZ	-25.3	+10	+18	+.6	28	-12.7	28	-19.2	-62.2	+10	+18	+.6	-1.8	+10	+8	+100	26.9	-4.0	33.5	17°	37.5

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16 ELEMENT ARRAY

DATA POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER ATTD.	BEAM-FORMER CORRECTION	B+C	A+E	J+K	I+E	NOISE LEVEL dBV	MCPS-32 CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	BAND-WIDTH CORRECTION	BAND-WIDTH CONVERSION	ARRAY SENSITIVITY	MP2 CONVERSION	SNR H-F	LINEAR PROCESSING CORRECTION	CORRECTED SNR	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
	DATE: 2-8-77 TIME: 02622																					
7	RANGE: 28 N.M. 140 HZ	-22.8	+10	+21	+.2	24	+1.2	24	-41.4	-65.4	+10	+24	+.2	-1.8	+10	+12	+100	43.6	-4.0	39.8	-21.5°	47.8
	DEPTH: 1980FM 290 HZ	-26.6	+10	+24	+.8	24	-2.6	24	-47.8	-71.8	+10	+24	+.8	-1.8	+10	+8	+100	45.2	-4.0	42.0	-21.5°	46.0
	295 HZ	-62.4	+10	+24	+.8	24	-38.4	24	-47.8	-71.8	+10	+24	+.8	-1.8	+10	+8	+100	9.4	-4.4	5.9	-21.5°	10.3
	DATE: 3-15-77 TIME: 15012																					
8	RANGE: 22 N.M. 140 HZ	-27.1	+10	+18	+.2	28	+5.9	28	-33.1	-61.6	+10	+18	+.2	-1.8	+10	+12	+100	39.5	-4.8	35.7	+30°	39.7
	DEPTH: 2800FM 290 HZ	-27.8	+10	+18	+.8	28	+1.2	28	-45.6	-73.6	+10	+18	+.8	-1.8	+10	+8	+100	51.8	-4.0	48.6	+30°	52.6
	295 HZ	-58.6	+10	+18	+.9	28	-30.8	28	-39.6	-67.6	+10	+18	+.8	-1.8	+10	+8	+100	8.8	-4.6	5.0	+30°	9.6
	DATE: 3-15-77 TIME: 21312																					
9	RANGE: 72 N.M. 140 HZ	-22.5	+10	+12	+.1	22	-.5	22	-36.3	-58.7	+10	+12	+.1	-1.8	+10	+12	+100	36.2	-4.0	32.3	+51.5°	36.3
	DEPTH: 2800FM 290 HZ	-43.3	+10	+12	+.6	22	+8.7	22	-43.2	-65.2	+10	+12	+.6	-1.8	+10	+8	+100	51.9	-4.0	48.5	+51.5°	52.5
	295 HZ	-51.9	+10	+12	+.7	22	-29.9	22	-42.8	64.8	+10	+12	+.7	-1.8	+10	+8	+100	12.9	-4.2	.7	+51.5°	4.9
	DATE: 3-16-77 TIME: 0633																					
10	RANGE: 128 N.M. 140 HZ	-16.8	+10	+12	+.2	22	+5.2	22	-23.6	-45.6	+10	+12	+.2	-1.8	+10	+12	+100	28.8	-4.0	25.0	+61°	29.0
	DEPTH 2800FM 290 HZ	-35.8	+10	+12	+.8	22	-13.8	22	-37.4	-59.4	+10	+12	+.8	-1.8	+10	+8	+100	23.6	-4.0	20.4	+61°	24.4
	DATE: 3-16-77 TIME: 09352																					
11	RANGE: 122 N.M. 140 HZ	-28.6	+10	+18	+.2	28	-.8	28	-28.2	-56.2	+10	+18	+.2	-1.8	+10	+12	+100	27.4	-4.0	23.6	+63°	27.6
	DEPTH: 2800FM 290 HZ	-45.4	+10	+18	+.8	28	-17.4	28	-36.2	-64.2	+10	+18	+.8	-1.8	+10	+8	+100	18.8	-4.1	15.5	+63°	19.6
	DATE: 3-16-77 TIME: 11482																					
12	RANGE: 122 N.M. 140 HZ	-22.8	+10	+18	+.2	28	+5.2	28	-27.1	-55.1	+10	+18	+.2	-1.8	+10	+12	+100	32.3	-4.0	28.5	+64°	32.5
	DEPTH: 2800FM 290 HZ	-39.9	+10	+18	+.8	28	-11.9	28	-29.8	-57.8	+10	+18	+.8	-1.8	+10	+8	+100	17.9	-4.2	14.5	+64°	18.7

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32 ELEMENT ARRAY

DATA POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCM-32 CAL CORRECTION	BEAM-FORMER ATTN	BEAM-FORMER CORRECTION	B+C	A+E	J+K	I+G	NOISE LEVEL dBV	MCM-32 CAL CORRECTION	BEAM-FORMER ATTN	BEAM-FORMER CORRECTION	BAND-WIDTH CORRECTION	BAND-WIDTH CORRECTION	ARRAY SENSITIVITY	AP's CORRECTION	SNR H-F	NOISE PARAMETER CORRECTION	COHERENT SNR DIR	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
	DATE: 1-19-77 TIME: 1551Z																					
1	RANGE: 91 N.M. 290 HZ	-57.2	+10	+18	+.8	+28	-29.2	+29	-29.9	-79.9	+10	+18	+.8	-1.8	+15	+8	+100	17.7	-4.1	14.1	-59°	18.5
	DEPTH: 1650 FM 285 HZ	-65	+10	+18	+.8	+28	-37.2	+28	-36.8	-73.8	+10	+18	+.8	-1.8	+15	+8	+100	9.8	-4.4	6.2	-59°	10.6
	DATE: 1-19-77 TIME: 1600Z																					
2	RANGE: 91 N.M. 290 HZ	-55.8	+10	+18	+.8	+28	-27.8	+28	-41	-69.0	+10	+18	+.8	-1.8	+15	+8	+100	13.2	-4.2	9.8	-58.5°	14.0
	DEPTH: 1650 FM 285 HZ	-61.3	+10	+18	+.8	+28	-37.3	+28	-41	-69.0	+10	+18	+.8	-1.8	+15	+8	+100	7.7	-4.2	3.8	-58.5°	8.5
	DATE: 2-7-77 TIME: 0939Z																					
3	RANGE: 175 N.M. 190 HZ	-36.6	+10	+24	+.2	+34	-2.6	+34	-34.1	-61.1	+10	+24	+.2	-1.8	+10	+12	+100	29.5	-4.0	30.7	35.5°	34.7
	DEPTH: 1900 FM 280 HZ	-45.2	+10	+24	+.8	+34	-11.2	+34	-35.4	-69.1	+10	+24	+.8	-1.8	+10	+8	+100	33.9	-4.0	30.7	35.5°	34.7
	DATE: 2-7-77 TIME: 1019Z																					
4	RANGE: 159 N.M. 140 HZ	-38.2	+10	+24	+.2	+34	-5.2	+34	-34.8	-58.8	+10	+24	+.2	-1.8	+10	+12	+100	19.6	-4.0	15.8	35.5°	18.8
	DEPTH: 1800 FM 280 HZ	-54.4	+10	+24	+.8	+34	-20.4	+34	-38.8	-68.8	+10	+24	+.8	-1.8	+10	+8	+100	14.4	-4.2	11.0	35.5°	15.2
	DATE: 2-7-77 TIME: 1549Z																					
5	RANGE: 110 N.M. 140 HZ	-31.3	+10	+24	+.2	+34	+3.7	+34	-36.8	-68.8	+10	+24	+.2	-1.8	+10	+12	+100	29.5	-4.0	35.7	49°	21.7
	DEPTH: 1900 FM 280 HZ	-41.2	+10	+24	+.8	+34	-7.2	+34	-31.9	-65.9	+10	+24	+.8	-1.8	+10	+8	+100	29.7	-4.0	36.6	49°	30.6
	DATE: 2-7-77 TIME: 2033Z																					
6	RANGE: 70 N.M. 140 HZ	-29.8	+10	+24	+.2	+34	+4.2	+34	-36.3	-68.3	+10	+24	+.2	-1.8	+10	+12	+100	30.5	-4.0	36.7	17°	30.3
	DEPTH: 1900 FM 280 HZ	-29.2	+10	+24	+.8	+34	+4.8	+35	-30.5	-66.5	+10	+24	+.8	-1.8	+10	+8	+100	35.3	-4.0	38.1	17°	36.1

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32 ELEMENT ARRAY

DATA POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV	MCD-32 CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	B+C	A+E	J+K	I+G	NOISE LEVEL dBV	MCD-32 CAL CORRECTION	BEAM-FORMER ATTN.	BEAM-FORMER CORRECTION	BAND-WIDTH CORRECTION	BAND-WIDTH CORRECTION	ARRAY SENSITIVITY	A/B RECEIVER-SION	SNR W-F	NINETY PERCENT CORRECTION	CORRECTED SNR DER	STEERING ANGLE	Q+L
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
	DATE: 2-8-77 TIME: 0202Z																					
7	RANGE: 200 N.M. 140 HZ	-25.1	+10	+30	+.3	+40	+14.9	+40	-27.2	-67.2	+10	+30	+.3	-1.8	+10	+12	+100	43.1	-4.0	38.4	-21.5	43.4
	DEPTH: 1500 FM 240 HZ	-28.5	+10	+30	+.8	+40	+11.5	+40	-33.8	-73.8	+10	+30	+.8	-1.8	+10	+8	+100	45.5	-4.0	42.1	-21.5	46.1
	245 HZ	-69.7	+10	+30	+.8	+40	-34.7	+40	-33.6	-73.6	+10	+30	+.8	-1.8	+10	+8	+100	8.9	-4.4	5.3	-21.5	9.7
	DATE: 3-1-77 TIME: 1501Z																					
8	RANGE: 220 N.M. 140 HZ	-27.2	+10	+30	+.2	+40	+13.8	+40	-35.1	-75.1	+10	+30	+.2	-1.8	+10	+12	+100	47.9	-4.0	44.1	+30	48.1
	DEPTH: 2800 FM 240 HZ	-23.8	+10	+30	+.8	+40	+16.2	+40	-36.2	-75.2	+10	+30	+.8	-1.8	+10	+8	+100	51.4	-4.0	48.2	+30	52.2
	245 HZ	-60.9	+10	+30	+.8	+40	-34.4	+40	-34.4	-74.4	+10	+30	+.8	-1.8	+10	+8	+100	14.0	-4.2	10.6	+30	14.8
	DATE: 3-15-77 TIME: 2131Z																					
9	RANGE: 72 N.M. 140 HZ	-21.9	+10	+24	+.2	+34	+12.1	+34	-30.5	-64.5	+10	+24	+.2	-1.8	+10	+12	+100	43.6	-4.0	38.3	+51.5	43.8
	DEPTH: 2800 FM 240 HZ	-22.2	+10	+24	+.6	+34	+19.8	+34	-33.1	-67.1	+10	+24	+.6	-1.8	+10	+8	+100	52.9	-4.0	49.5	+51.5	53.5
	245 HZ	-52.7	+10	+24	+.8	+34	-16.7	+34	-33.2	-67.2	+10	+24	+.8	-1.8	+10	+8	+100	14.5	-4.2	11.1	+51.5	15.3
	DATE: 3-16-77 TIME: 0637Z																					
10	RANGE: 130 N.M. 140 HZ	-18.6	+10	+18	+.2	+28	+9.4	+28	-32	-50.0	+10	+18	+.2	-1.8	+10	+12	+100	31.4	-4.0	27.6	+61	31.6
	DEPTH: 2800 FM 240 HZ	-35.8	+10	+18	+.8	+28	-7.8	+28	-31.1	-59.1	+10	+18	+.8	-1.8	+10	+8	+100	23.3	-4.0	20.2	+61	23.2
	DATE: 3-16-77 TIME: 0935Z																					
11	RANGE: 122 N.M. 140 HZ	-30.6	+10	+24	+.2	+34	+3.4	+34	-35.6	-59.6	+10	+24	+.3	-1.8	+10	+12	+100	29.0	-4.0	25.3	+62	29.3
	DEPTH: 2800 FM 240 HZ	-45.6	+10	+24	+.7	+34	-11.6	+34	-34.9	-68.9	+10	+24	+.7	-1.8	+10	+8	+100	23.3	-4.0	20.0	+62	24.0
	DATE: 3-16-77 TIME: 1198Z																					
12	RANGE: 122 N.M. 140 HZ	-18.9	+10	+18	+.2	+28	+9.1	+28	-33.6	-50.6	+10	+18	+.2	-1.8	+10	+12	+100	31.7	-4.0	27.9	+62	31.9
	DEPTH: 2800 FM 240 HZ	-35.8	+10	+18	+.8	+28	-7.8	+28	-36.6	-54.6	+10	+18	+.8	-1.8	+10	+8	+100	18.8	-4.1	15.6	+62	19.6

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MAX. ELEMENT ARRAY

DATA POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV A	MCPS-32 CAL CORRECTION B	BEAM-FORMER ATTN. C	BEAM-FORMER CORRECTION D	B+C E	A+E F	J+K G	I+G H	NOISE LEVEL dBV I	MCPS-32 CAL CORRECTION J	BEAM-FORMER ATTN. K	BEAM-FORMER CORRECTION L	BAND-WIDTH CORRECTION M	BAND-WIDTH CORRECTION N	ARRAY SENSITIVITY O	MP_2 CORRECTION P	SNR H-F Q	LINEAR PROCESSING CORRECTION R	CORRECTED SNR U&R S	STEERING ANGLE T	Q+L U
	DATE: 1-19-77 TIME: 1551B																					
1	RANGE: 91 N.M. 290 HZ	-28.4	NA	0	+.8	0	-28.4	0	-42.7	-97.7	NA	0	+.8	-1.8	+10	+8	+100	15.3	-4.2	11.9	-59°	16.1
	DEPTH: 1650FM 295 HZ	-37.1	NA	0	+.8	0	-37.1	0	-42.7	-97.7	NA	0	+.8	-1.8	+10	+8	+100	6.6	-4.9	3.5	-59°	7.4
	DATE: 1-19-77 TIME: 1600B																					
2	RANGE: 91 N.M. 290 HZ	-59.0	NO	+24	+.8	+24	-25.0	+24	-39.4	-93.4	+10	+24	+.8	-1.8	+10	+8	+100	14.4	-4.2	11.0	-58.5°	15.2
	DEPTH: 1650FM 295 HZ	-61.2	NO	+24	+.8	+24	-32.2	+24	-38.4	-93.4	+10	+24	+.8	-1.8	+10	+8	+100	7.2	-4.8	3.2	-58.5°	8.0
	DATE: 2-7-77 TIME: 0919Z																					
3	RANGE: 175 N.M. 140 HZ	-37.5	NO	+30	+.2	+40	12.5	+40	-35.8	-65.8	+10	+30	+.2	-1.8	+10	+12	+100	38.3	-4.0	34.5	35.5°	38.5
	DEPTH: 1800FM 290 HZ	-47.4	NO	+30	+.8	+40	-7.4	+40	-33.2	-73.2	+10	+30	+.8	-1.8	+10	+8	+100	35.8	-4.0	33.6	35.5°	36.6
	DATE: 2-7-77 TIME: 1012Z																					
4	RANGE: 159 N.M. 140 HZ	-42.4	NO	+30	+.2	+40	-2.4	+40	-25.6	-65.6	+10	+30	+.2	-1.8	+10	+12	+100	31.2	-4.0	17.4	35.5°	31.4
	DEPTH: 1800FM 290 HZ	-51.9	NO	+30	+.8	+40	-11.9	+40	-31.9	-71.9	+10	+30	+.8	-1.8	+10	+8	+100	19.5	-4.0	16.3	35.5°	20.3
	DATE: 2-7-77 TIME: 1549Z																					
5	RANGE: 110 N.M. 140 HZ	-36.2	NO	+30	+.2	+40	13.8	+40	-24.2	-64.2	+10	+30	+.2	-1.8	+10	+12	+100	38.0	-4.0	34.2	49°	38.2
	DEPTH: 1800FM 290 HZ	-42.8	NO	+30	+.8	+40	-3.8	+40	-29.2	-69.2	+10	+30	+.8	-1.8	+10	+8	+100	35.4	-4.0	33.2	49°	36.2
	DATE: 2-7-77 TIME: 2033Z																					
6	RANGE: 70 N.M. 140 HZ	-32.8	NO	+30	+.2	+40	17.2	+40	-26.8	-66.8	+10	+30	+.2	-1.8	+10	+12	+100	39.0	-4.0	38.2	17°	39.2
	DEPTH: 1900FM 290 HZ	-36.1	NO	+30	+.8	+40	15.9	+40	-28.8	-68.8	+10	+30	+.8	-1.8	+10	+8	+100	35.7	-4.0	33.5	17°	36.5

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MAX. ELEMENT ARRAY

DATA POINT	OPERATIONAL DATA	SIGNAL LEVEL dBV (A)	MCPI-32 CAL CORRECTION (B)	BEAM-FORMER ATTN. (C)	BEAM-FORMER CORRECTION (D)	B+C (E)	A+E (F)	J+K (G)	I+G (H)	NOISE LEVEL dBV (I)	MCDS-32 CAL CORRECTION (J)	BEAM-FORMER ATTN. (K)	BEAM-FORMER CORRECTION (L)	BAND-WIDTH CORRECTION (M)	BAND-WIDTH CONVERSION (N)	ARRAY SENSITIVITY (O)	MP2 CONVERSION (P)	SNR M-F (Q)	AMBIENT PROPELLER CORRECTION (R)	CORRECTED SNR U+R (S)	STEERING ANGLE (T)	Q+L (U)
7	DATE: 2-8-77 TIME: 0202Z																					
	RANGE: 28 N.M. 140 HZ	-33.8	+10	+30	+.2	+40	18.7	+40	-35.5	-66.5	+10	+30	+.2	-1.8	+10	+12	+100	44.2	-4.0	40.4	-21.5	44.9
	DEPTH: 1900 FMT 240 HZ	-28.8	+10	+30	+.8	+40	11.2	+40	-31.6	-71.6	+10	+30	+.8	-1.8	+10	+8	+100	43.8	-4.0	39.6	-31.5	43.6
	285 HZ	-65.0	+10	+30	+.9	+40	-35.0	+40	-37.3	-77.3	+10	+30	+.9	-1.8	+10	+8	+100	7.3	-4.8	7.4	-31.5	8.2
8	DATE: 3-15-77 TIME: 1501Z																					
	RANGE: 22 N.M. 140 HZ	-27.0	+10	+30	+.2	+40	13.0	+40	-31.6	-71.6	+10	+30	+.2	-1.8	+10	+12	+100	44.6	-4.0	40.8	+20.0	48.8
	DEPTH: 2800 FM 240 HZ	-24.0	+10	+30	+.8	+40	16.0	+40	-33.4	-73.4	+10	+30	+.8	-1.8	+10	+8	+100	39.4	-4.0	36.2	+20.0	50.2
	285 HZ	-59.0	+10	+30	+.8	+40	-20.0	+40	-33.1	-73.1	+10	+30	+.8	-1.8	+10	+8	+100	13.1	-4.2	9.7	+20.0	13.9
9	DATE: 3-16-77 TIME: 2102Z																					
	RANGE: 72 N.M. 140 HZ	-21.8	+10	+30	+.2	+40	16.2	+40	-39.2	-69.2	+10	+30	+.2	-1.8	+10	+12	+100	45.4	-4.0	41.6	+51.5	45.5
	DEPTH: 2800 FM 240 HZ	-18.2	+10	+30	+.9	+40	21.8	+40	-31.4	-71.4	+10	+30	+.9	-1.8	+10	+8	+100	53.2	-4.0	50.1	+51.5	55.1
	285 HZ	-56.3	+10	+30	+.8	+40	-16.3	+40	-31.4	-71.4	+10	+30	+.8	-1.8	+10	+8	+100	15.1	-4.2	11.7	+51.5	15.9
10	DATE: 3-17-77 TIME: 0637Z																					
	RANGE: 128 N.M. 140 HZ	-31.6	+10	+24	+.2	+34	13.4	+34	-20.9	-54.4	+10	+24	+.2	-1.8	+10	+12	+100	32.8	-4.0	29.0	+61	33.0
	DEPTH: 2800 FM 240 HZ	-39.6	+10	+24	+.9	+34	-5.6	+34	-30.8	-64.8	+10	+24	+.9	-1.8	+10	+8	+100	25.2	-4.0	22.1	+61	26.1
11	DATE: 3-16-77 TIME: 0935Z																					
	RANGE: 123 N.M. 140 HZ	-30.4	+10	+24	+.2	+34	3.6	+34	-33.6	-57.6	+10	+24	+.2	-1.8	+10	+12	+100	30.2	-4.0	26.2	+62	30.2
	DEPTH: 2800 FM 240 HZ	-42.4	+10	+24	+.8	+34	-8.4	+34	-33.1	-66.1	+10	+24	+.8	-1.8	+10	+8	+100	23.7	-4.0	20.5	+62	24.5
12	DATE: 3-16-77 TIME: 1148Z																					
	RANGE: 123 N.M. 140 HZ	-23.6	+10	+24	+.2	+34	-10.4	+34	-19.6	-53.6	+10	+24	+.2	-1.8	+10	+12	+100	30.0	-4.0	26.2	+64	30.2
	DEPTH: 2800 FM 240 HZ	-39.2	+10	+24	+.8	+34	-5.2	+34	-33.2	-57.2	+10	+24	+.8	-1.8	+10	+8	+100	18.0	-4.1	14.7	+64	18.8

SECRET

NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 7 DATE 2-8-77 TIME 0202Z

FREQUENCY 140 HZ

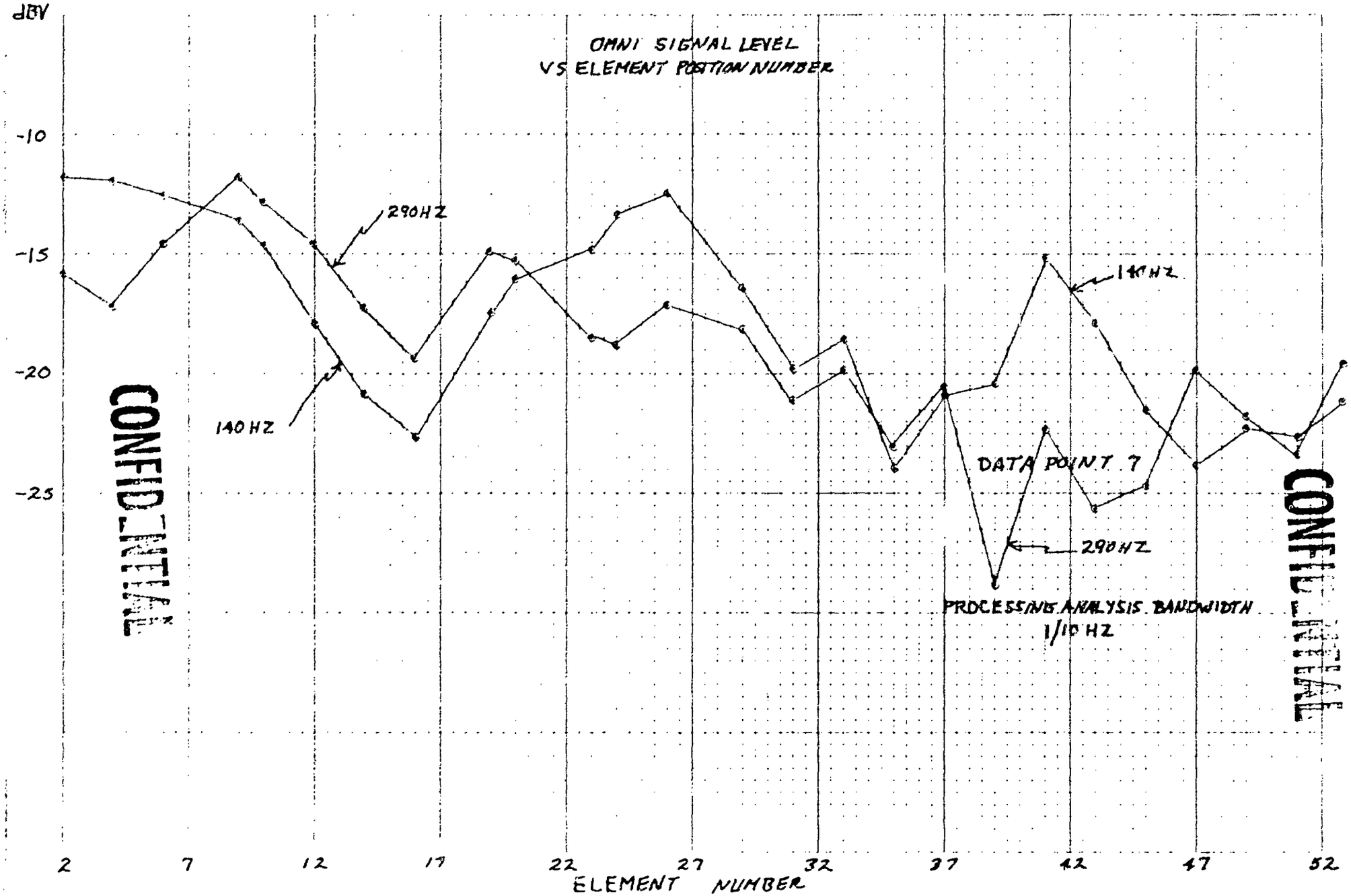
INDICATED NOISE LEVEL dBV 1/10 ABW		-50.1
SYSTEM SENSITIVITY dB/μB	-(-12)	= -38.1
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	= -29.9
CONVERSION TO dBreμPa/1HZ	+100	= +70.1

NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 7 DATE 2-8-77 TIME 0202Z

FREQUENCY 290 HZ

INDICATED NOISE LEVEL dBV 1/10 ABW			-54.0
SYSTEM SENSITIVITY dB/μB	-(-8)	=	-46.0
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	=	-37.8
CONVERSION TO dBreμPa/1HZ	+100	=	+62.2



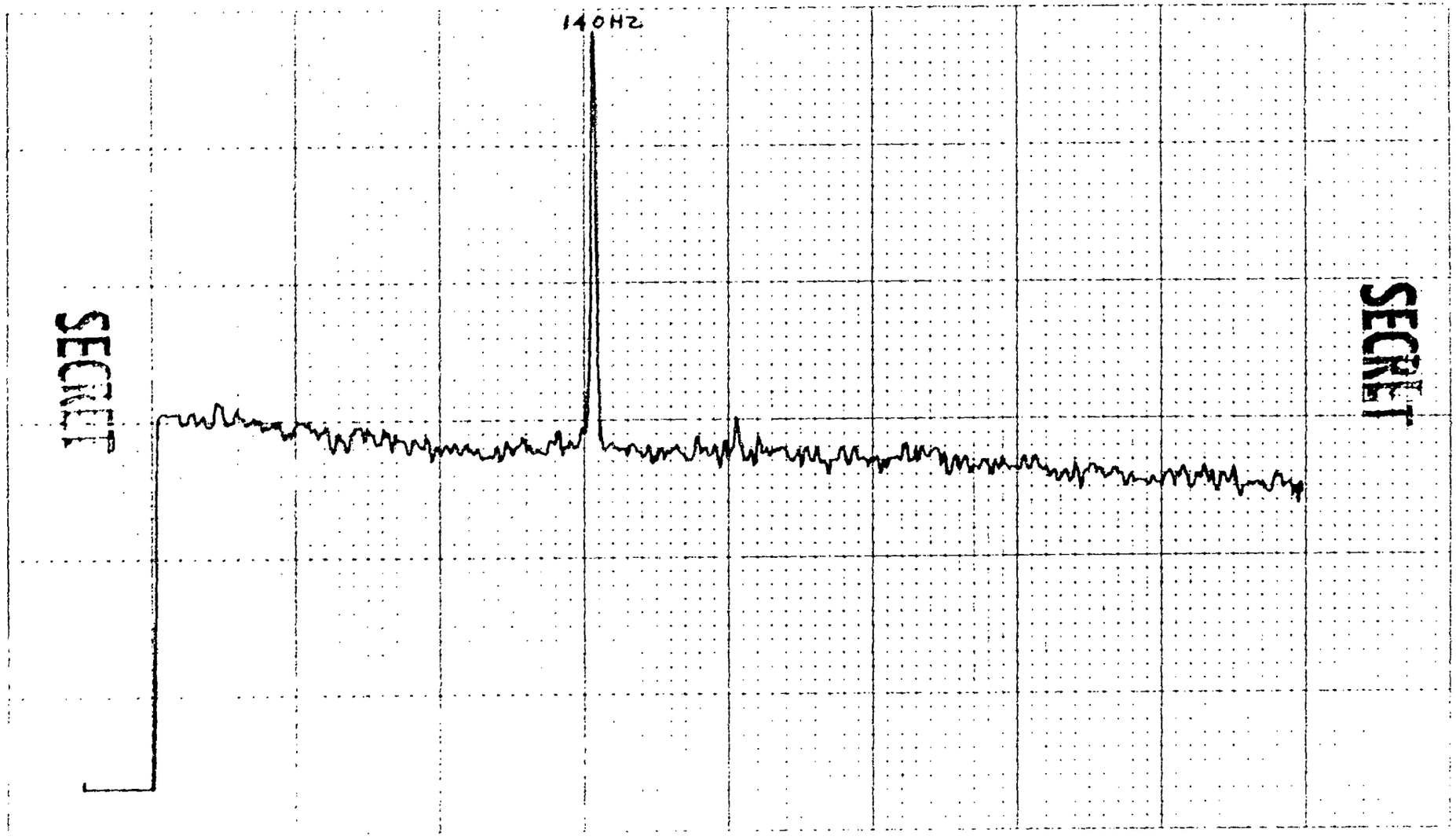
CONTROL: 28 -0202 (27)
OMNI SPECTRUM(ELEMENT 2)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



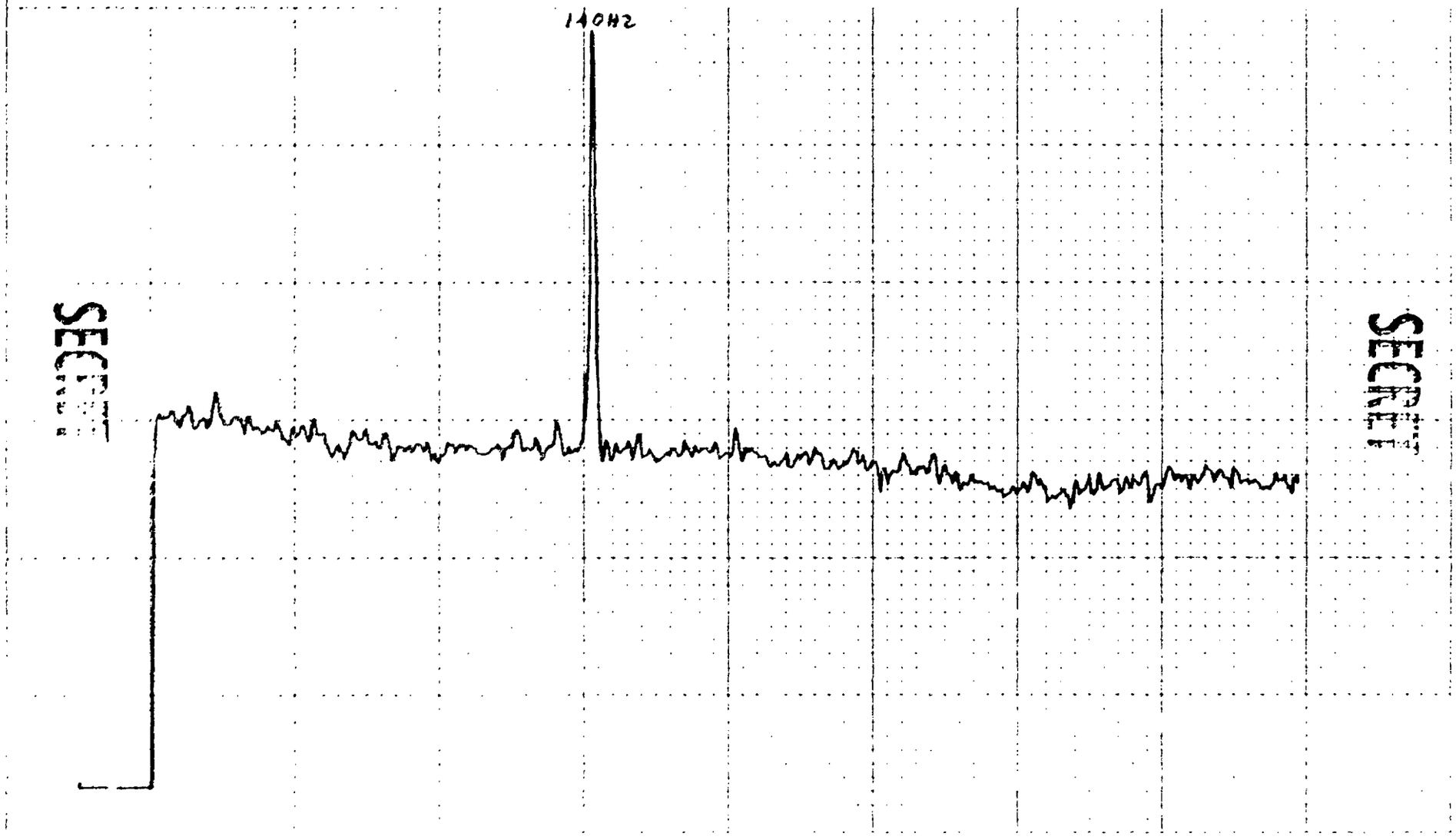
CONTROL: 2-8 -0202 (28)
OMNI SPECTRUM(ELEMENT 4)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



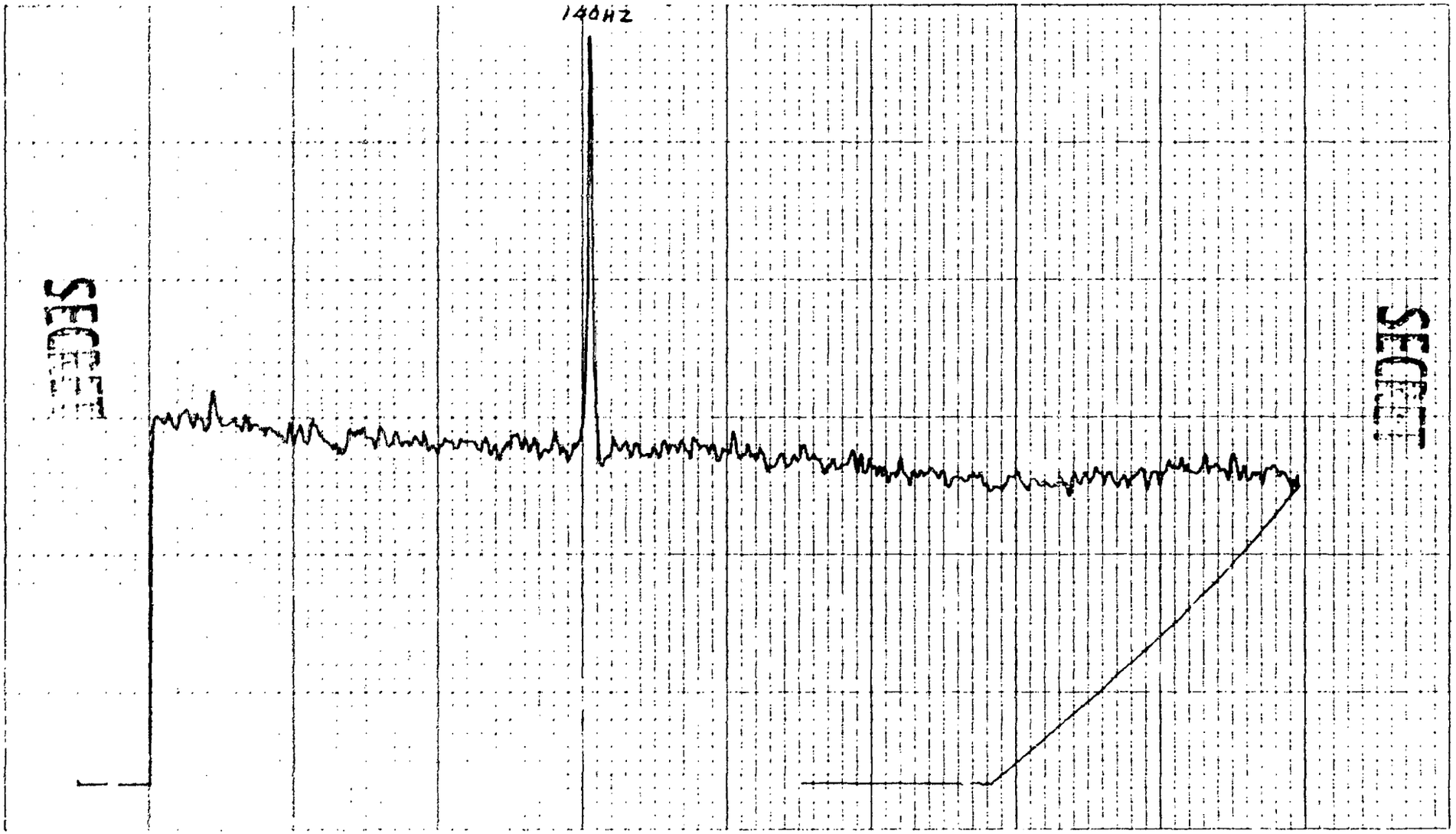
CONTROL: 0202 - 51 (DP7)
OMNI SPECTRUM (ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A. 46 0703

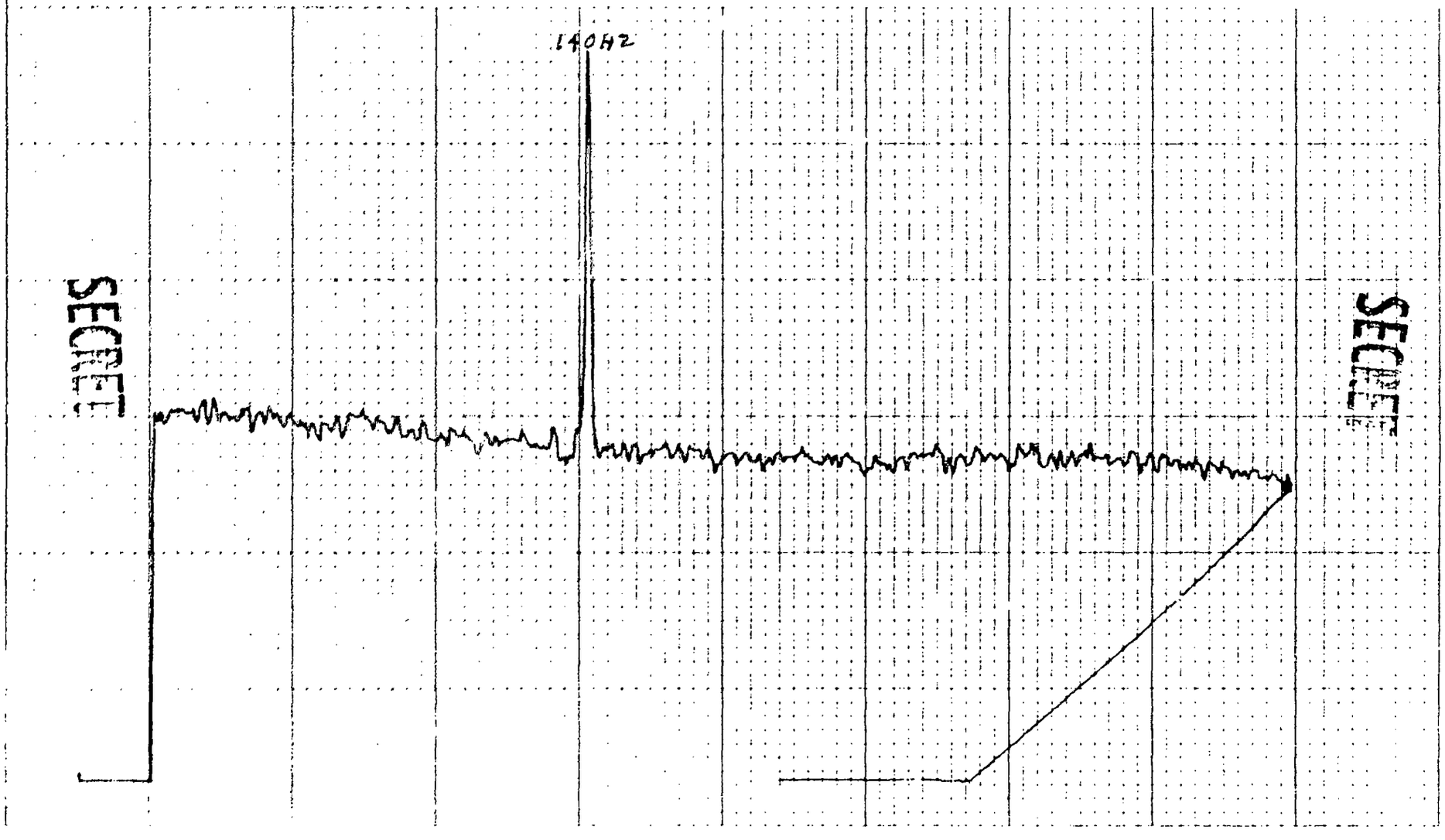
CONTROL: 2-8 -0202 (30)
OMNI SPECTRUM (ELEMENT 9)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10 HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



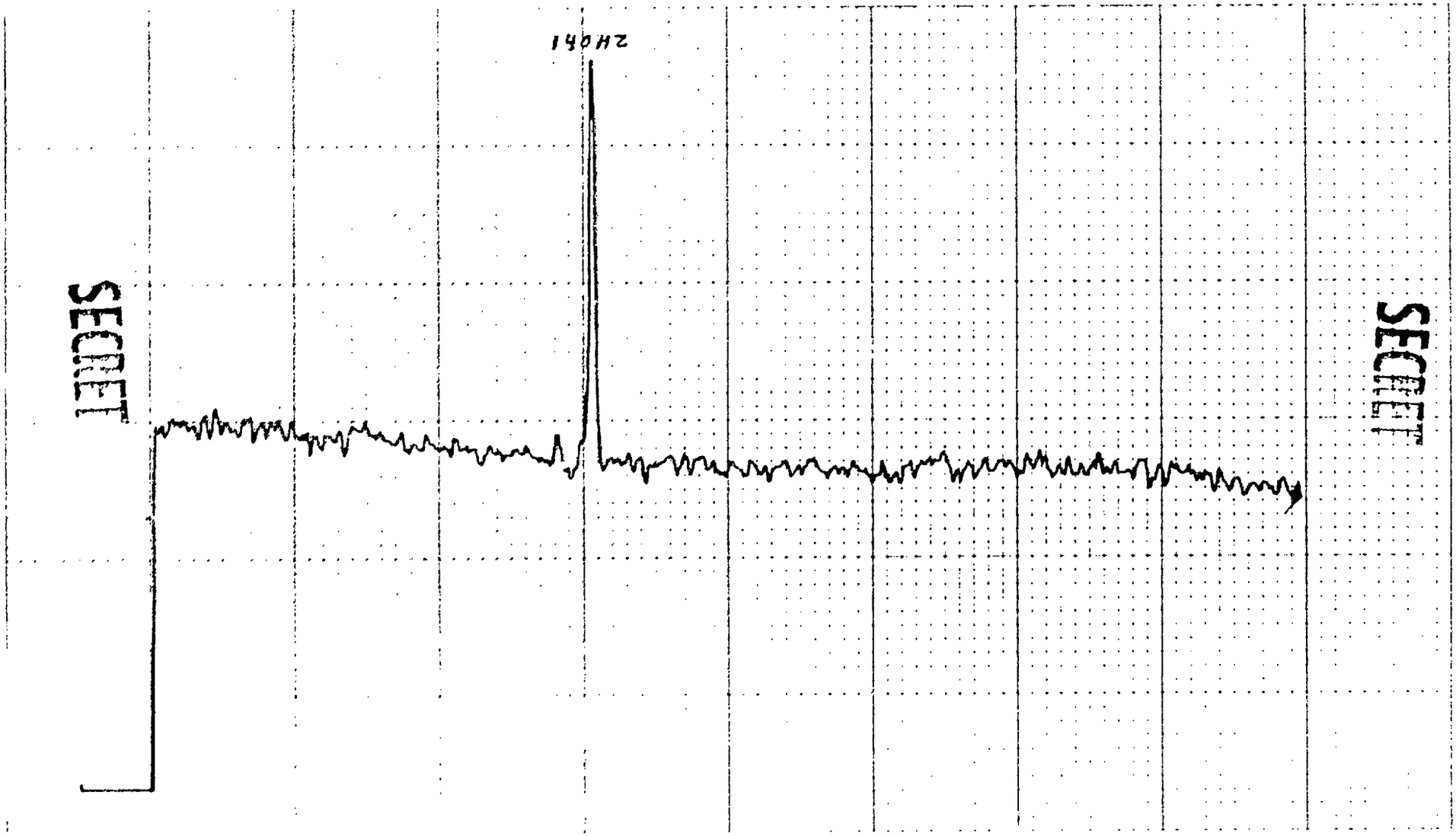
CONTROL: 2-8 -0202 (31)
OMNI SPECTRUM(ELEMENT 10)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



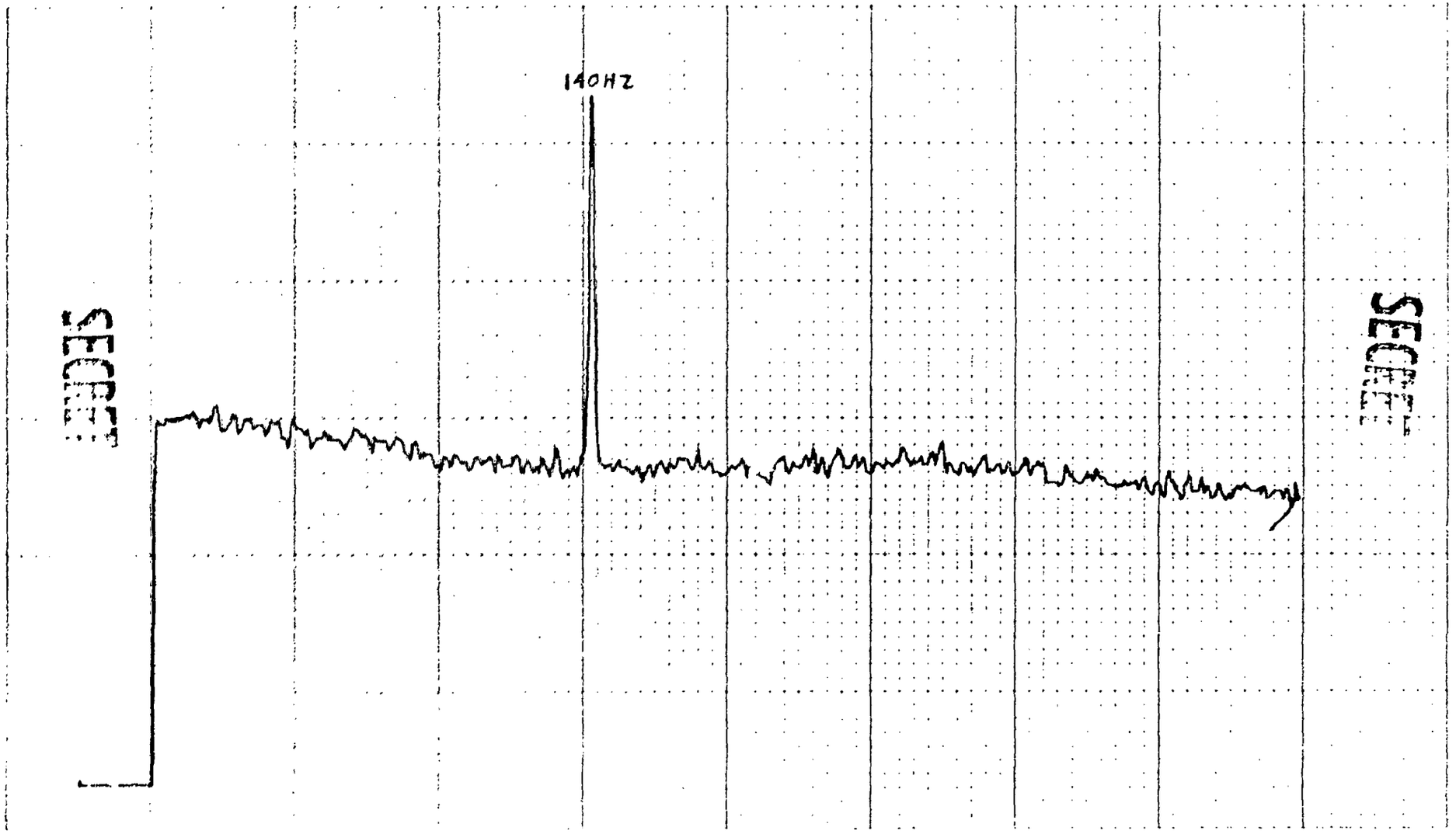
CONTROL: 2-8 - 0202 (32)
OMNI SPECTRUM (ELEMENT 12)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 - 02022
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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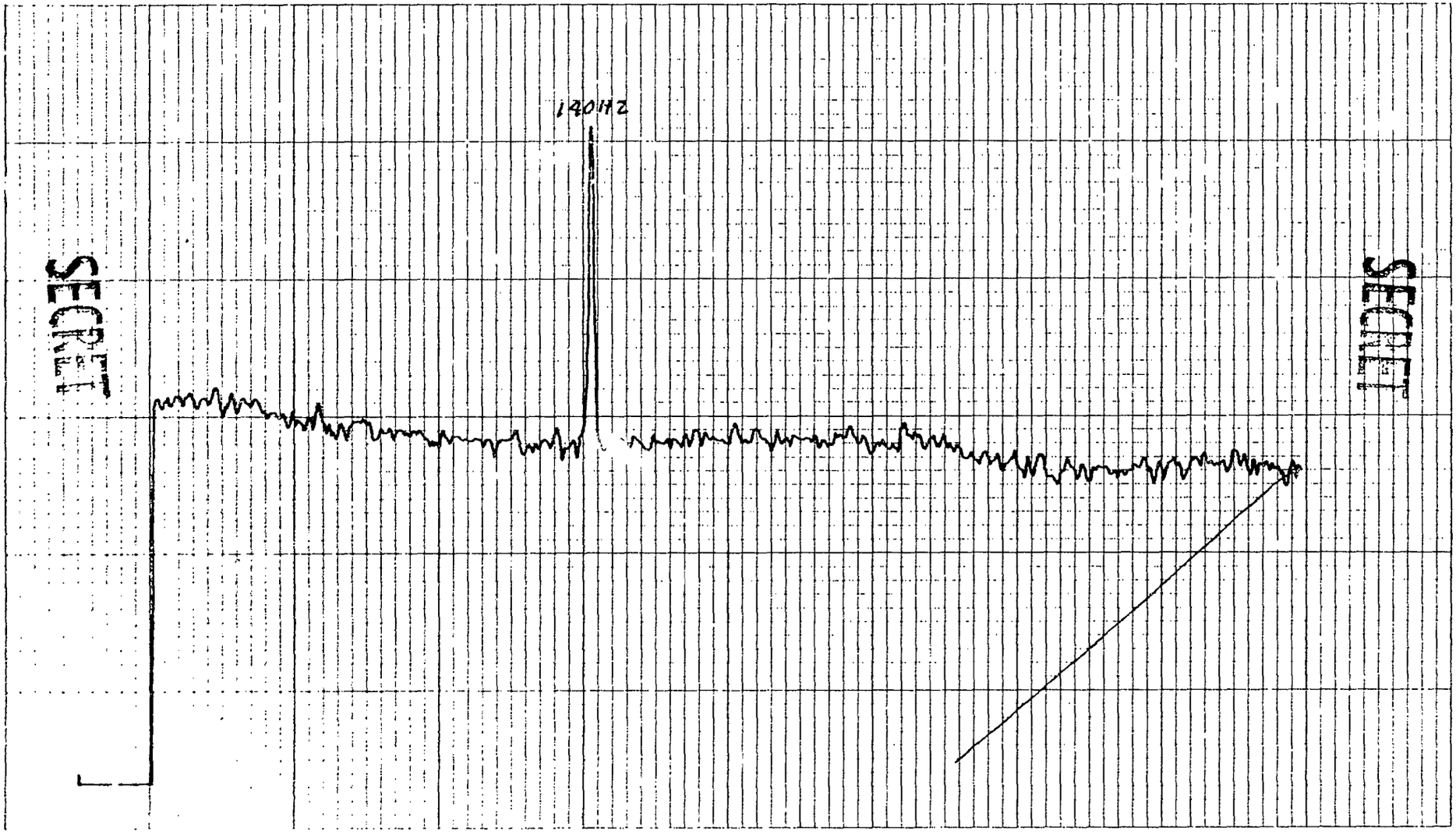
CONTROL: 2-8 -0202 (33)
OMNI SPECTRUM(ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



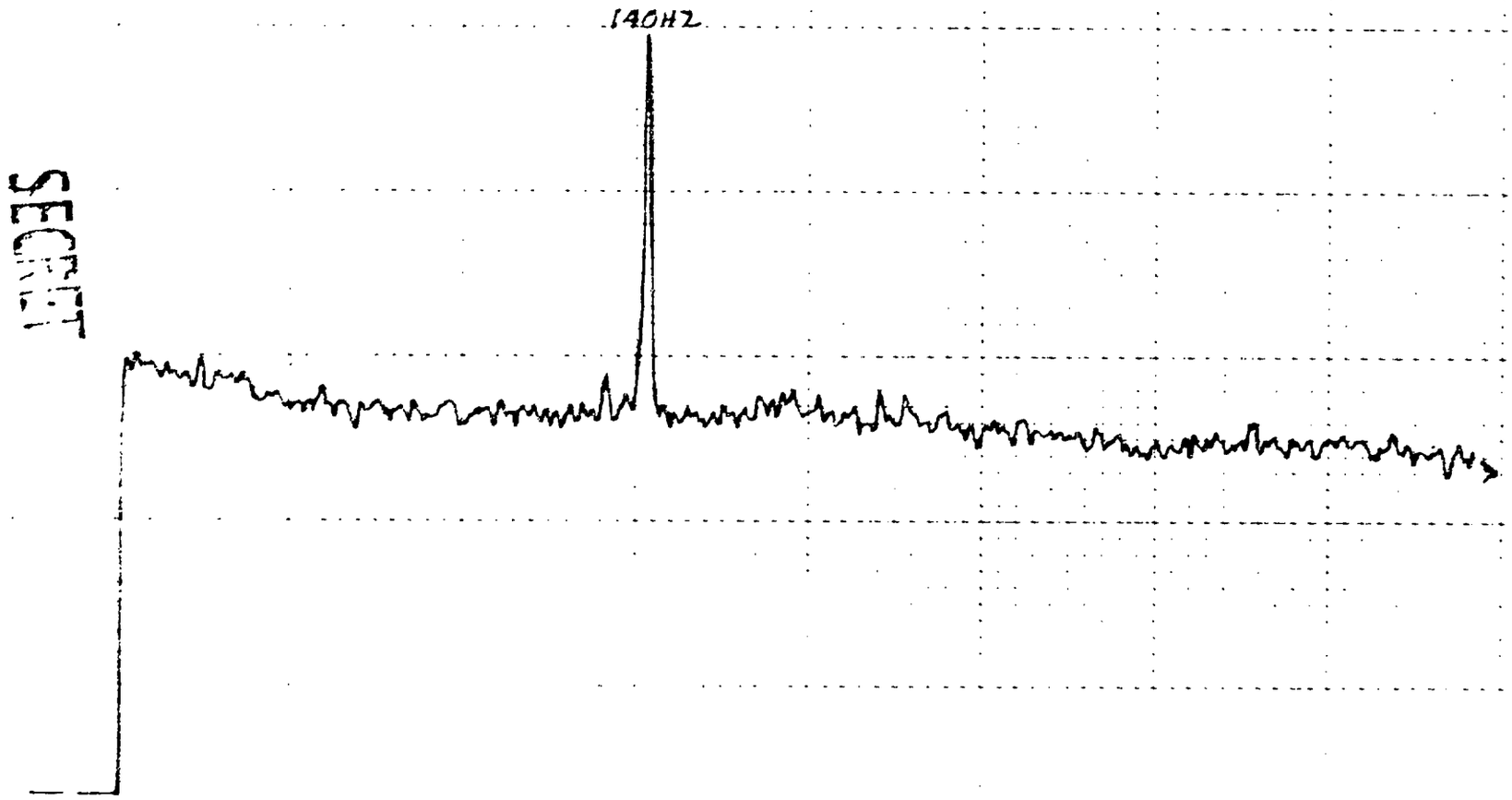
CONTROL: 2-8 -0202 (34)
OMNI SPECTRUM (ELEMENT 16)
EXERCISE: BEARING STAVE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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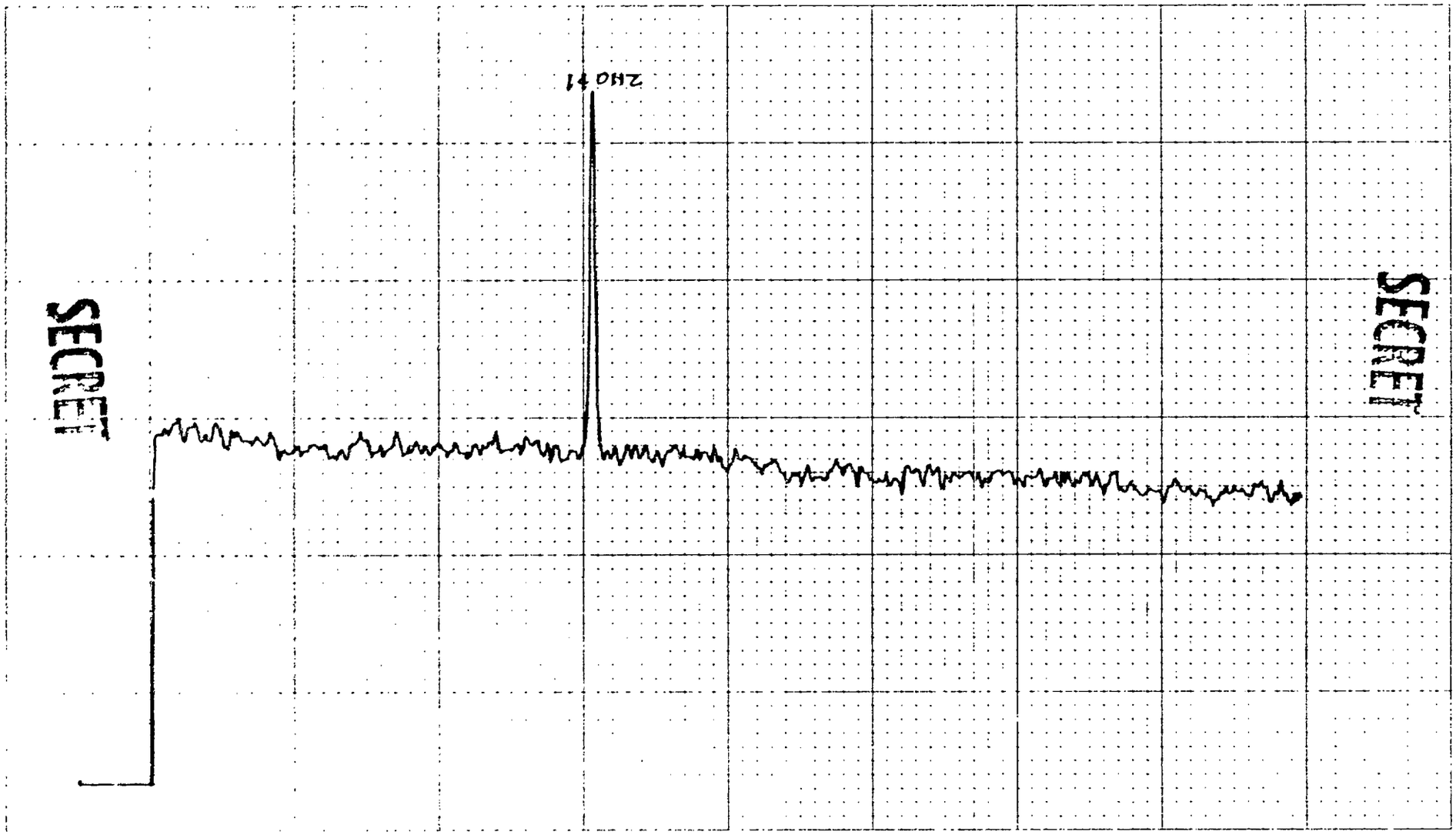
CONTROL: 2-8 -0202 (35)
OMNI SPECTRUM (ELEMENT 19)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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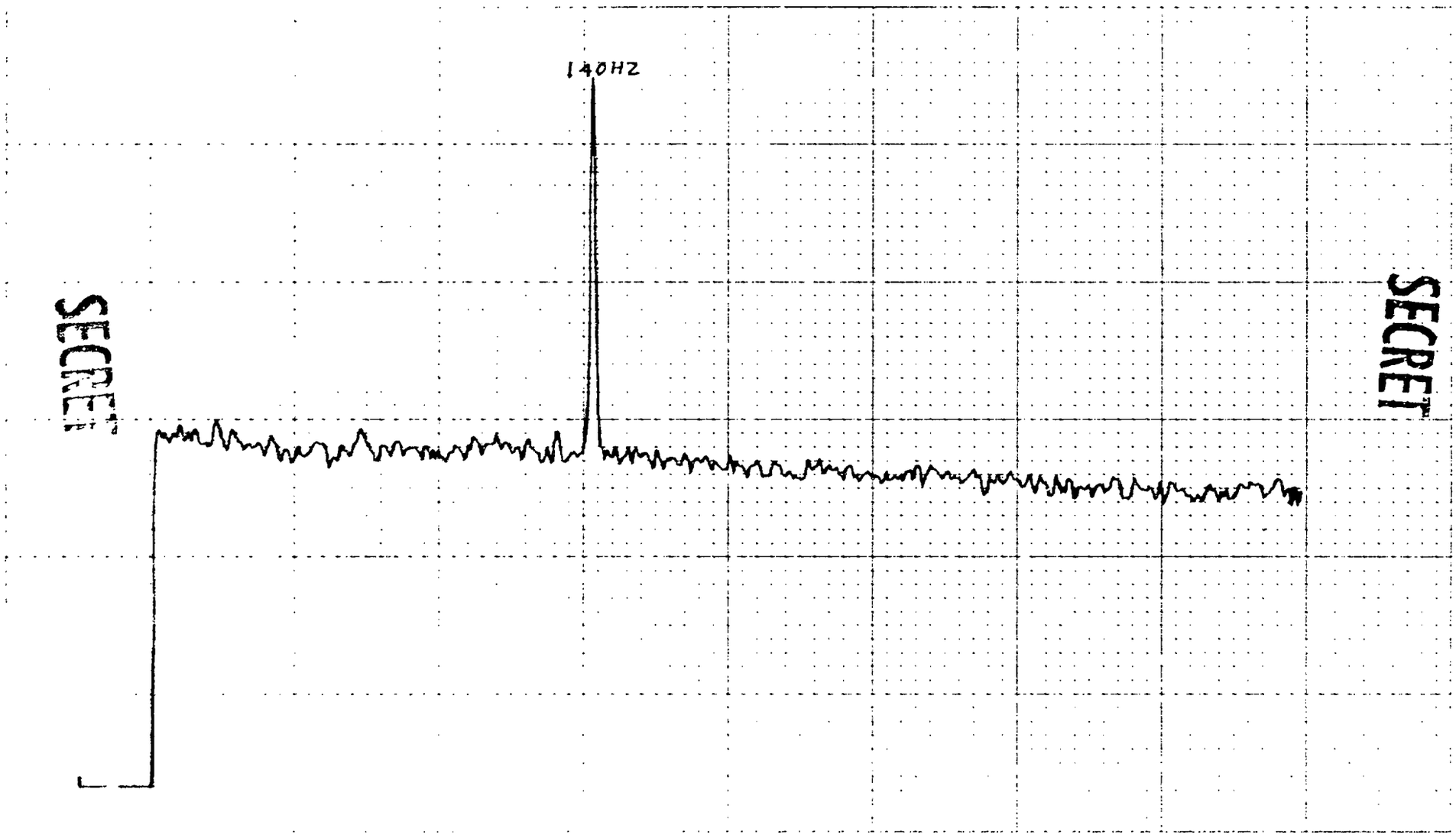
CONTROL: 2-8-0202(36)
OMNI SPECTRUM(ELEMENT 20)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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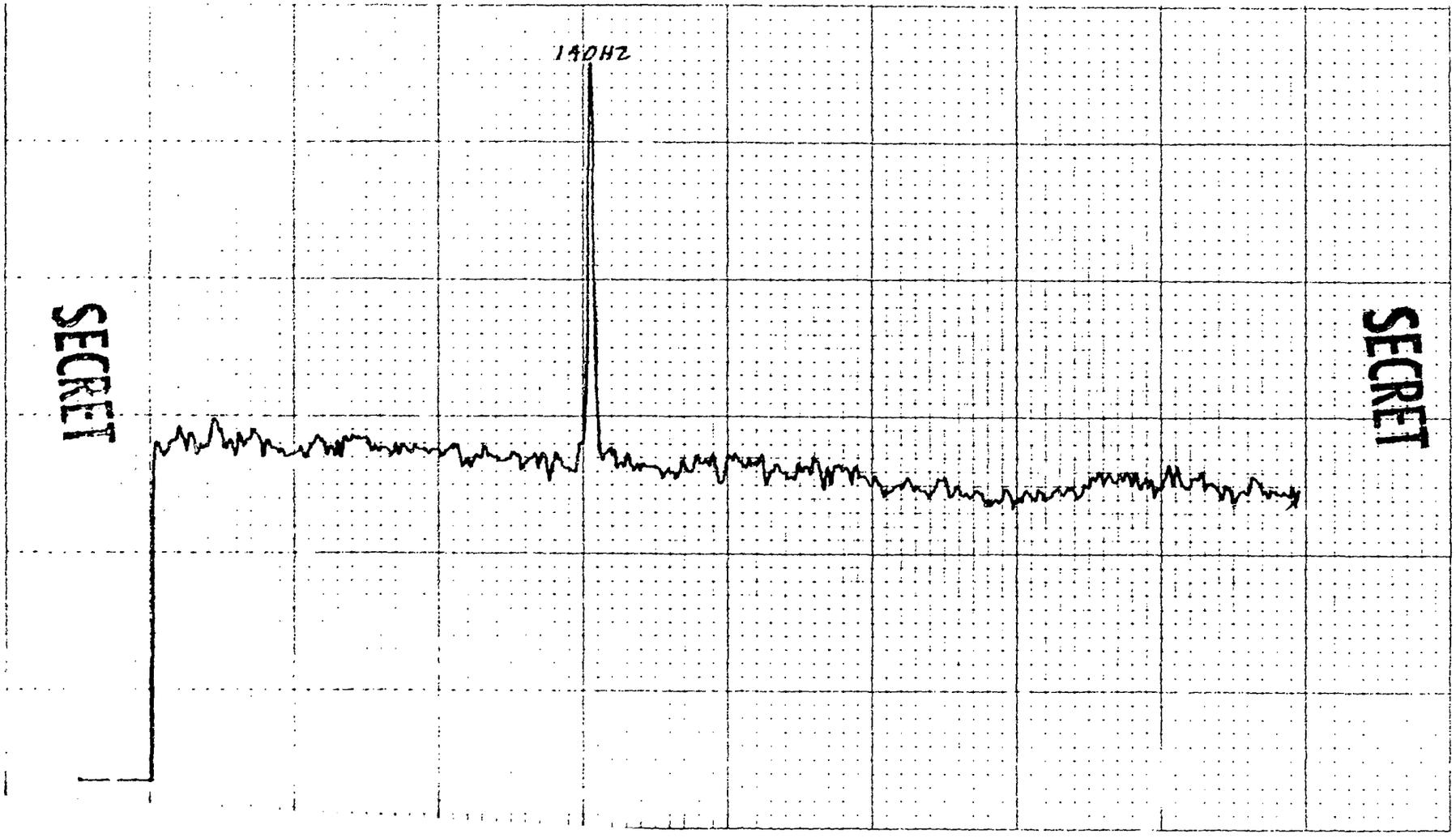
CONTROL: 2-8 -0202 (37)
OMNI SPECTRUM(ELEMENT 23)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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CONTROL: 2-8 -0202 (38)
OMNI SPECTRUM(ELEMENT 24)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

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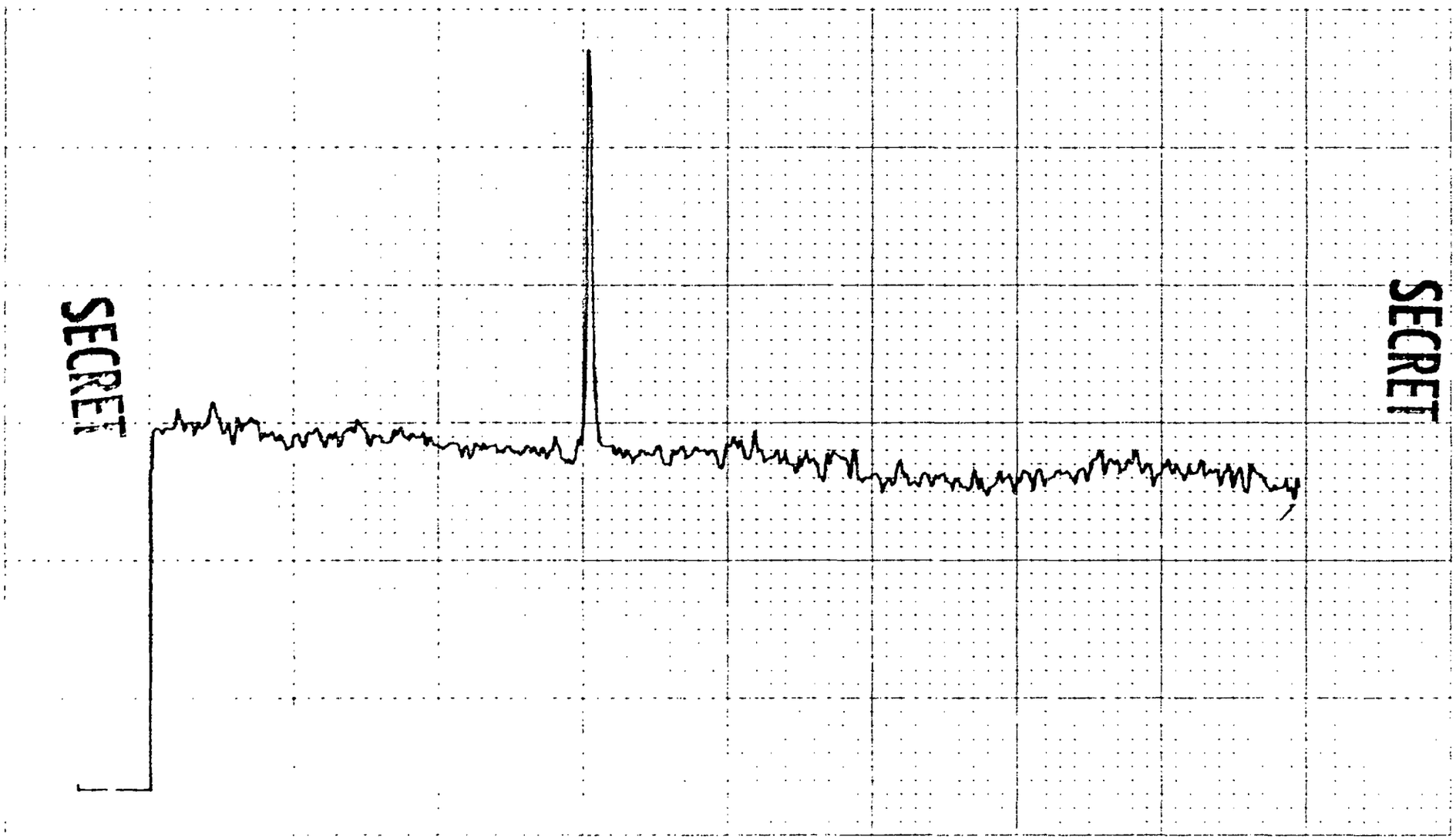

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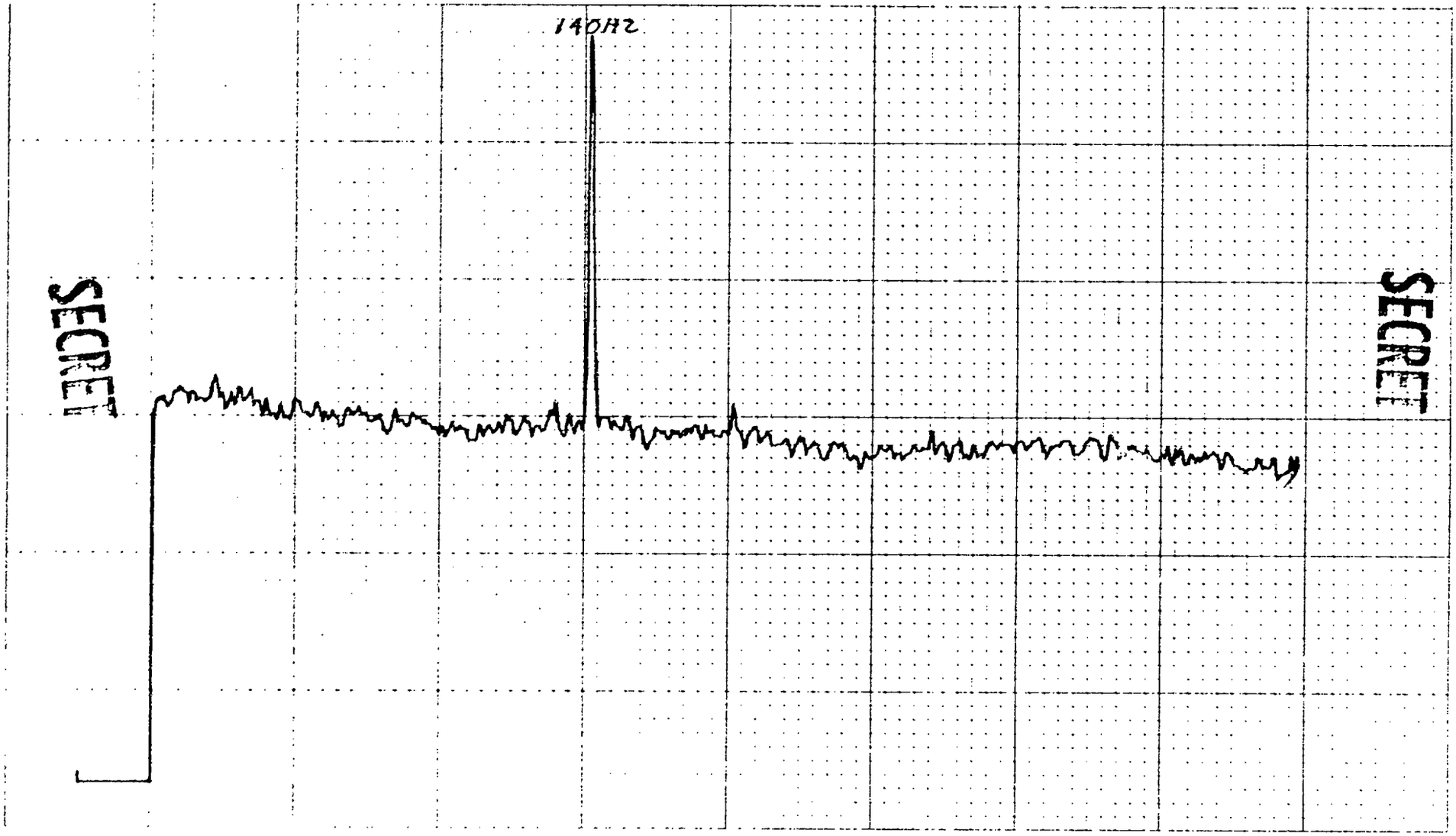
CONTROL: 28-0202(39)
OMNI SPECTRUM(ELEMENT 26)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME:28-77-0202Z
ANALYSIS BANDWIDTH:1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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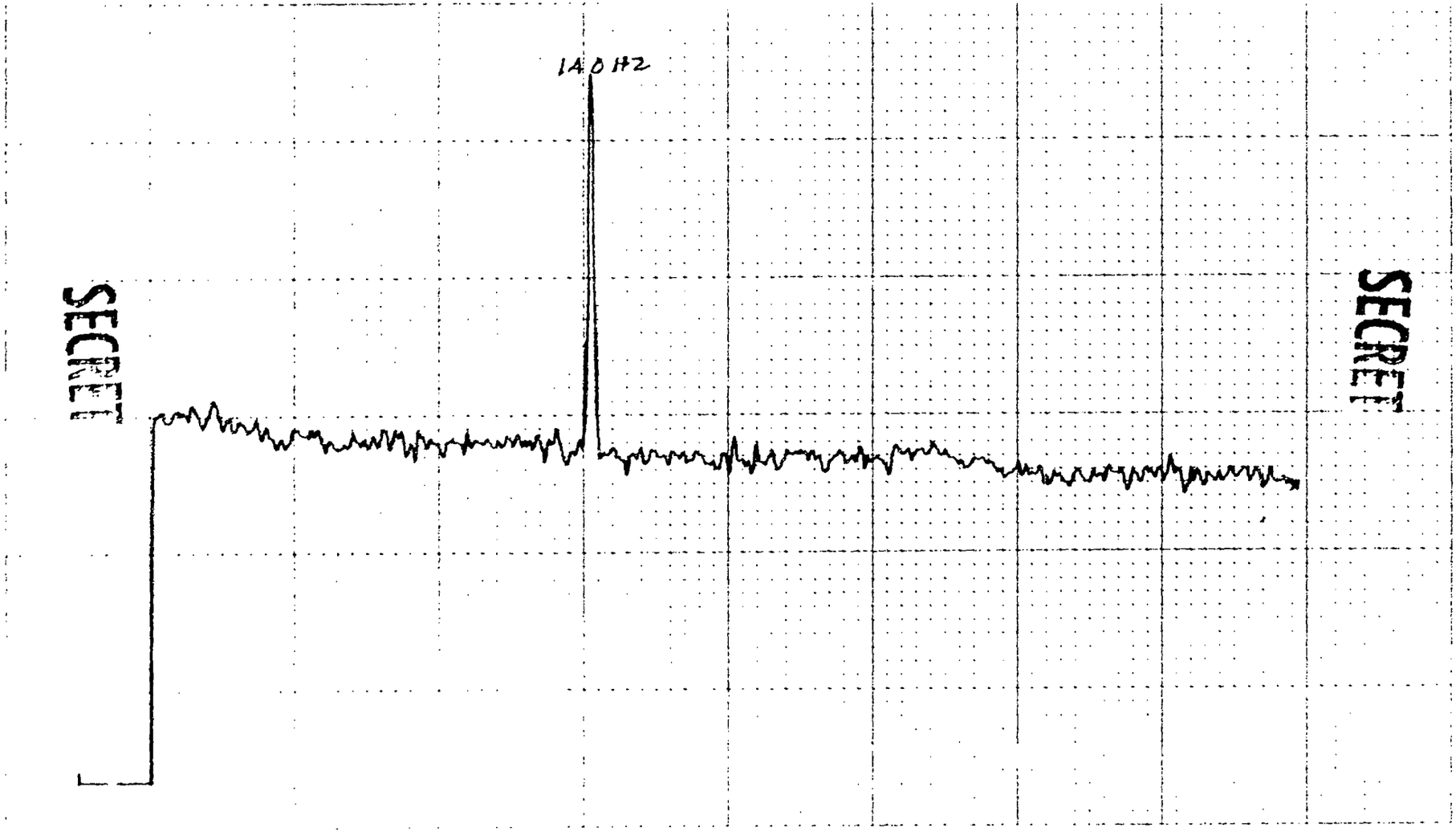
CONTROL: 2-8 -0202 (40)
OMNI SPECTRUM(ELEMENT 29)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

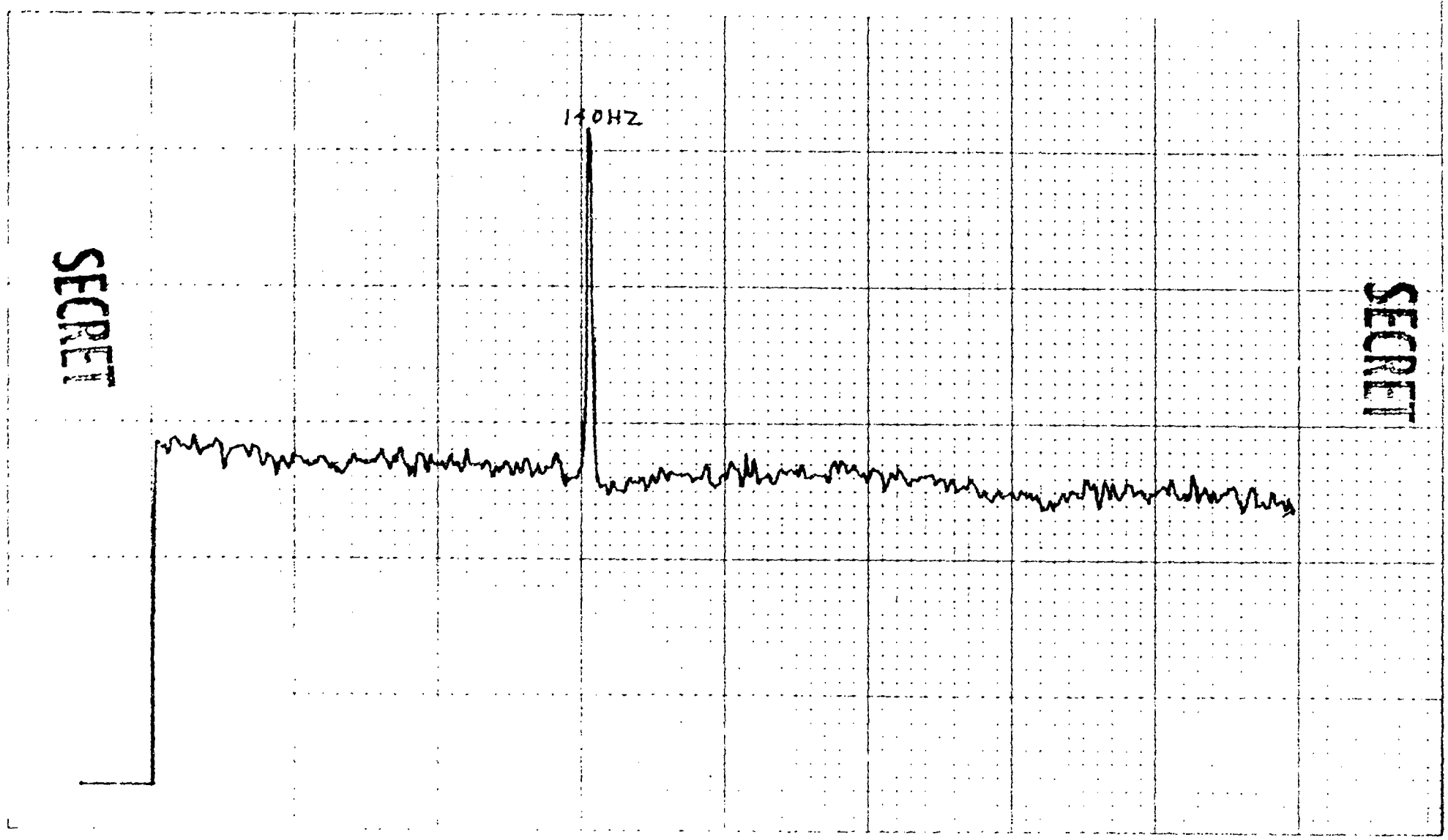
CONTROL: 2-8 -0202 (41)
OMNI SPECTRUM(ELEMENT 31)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

CONTROL: 2-8 -0202 (42)
OMNI SPECTRUM(ELEMENT 33)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

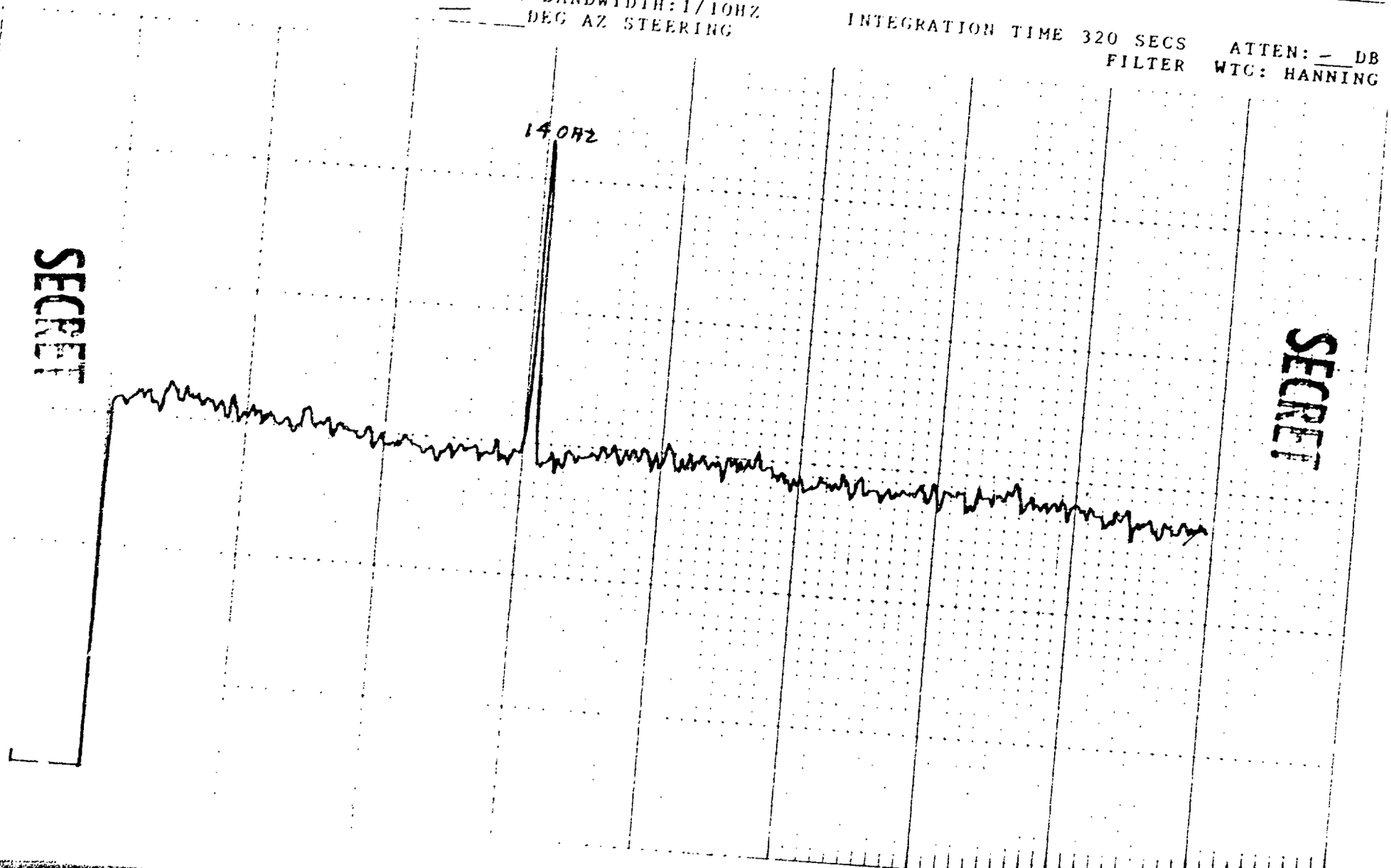
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
____DEG AZ STEERING

REEL: F29

INDEX 1145

INTEGRATION TIME 320 SECS
FILTER

ATTEN: _ DB
WTG: HANNING



46 0703

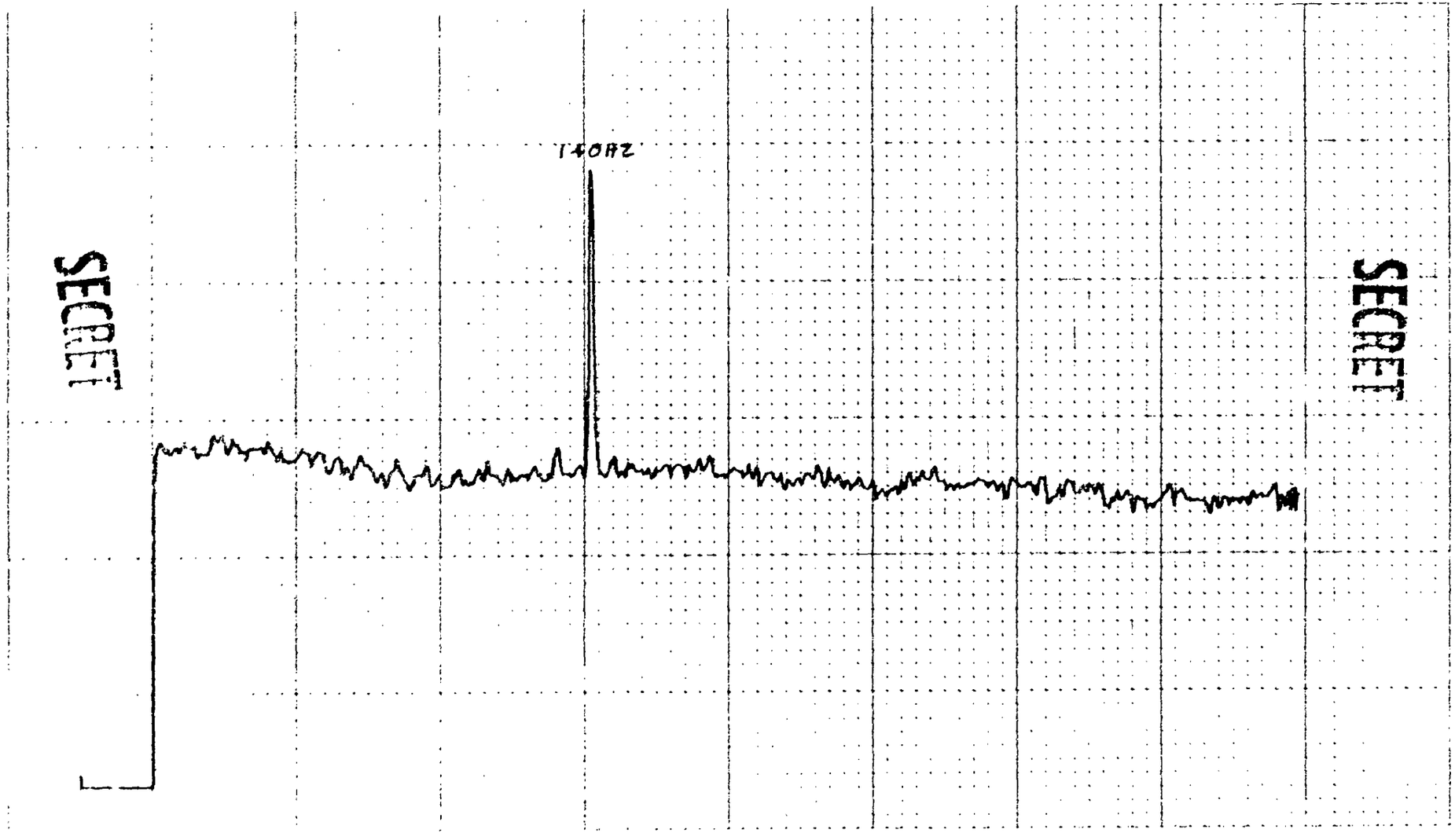
CONTROL: 2-8 -0202 (43)
OMNI SPECTRUM(ELEMENT 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG /Z STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



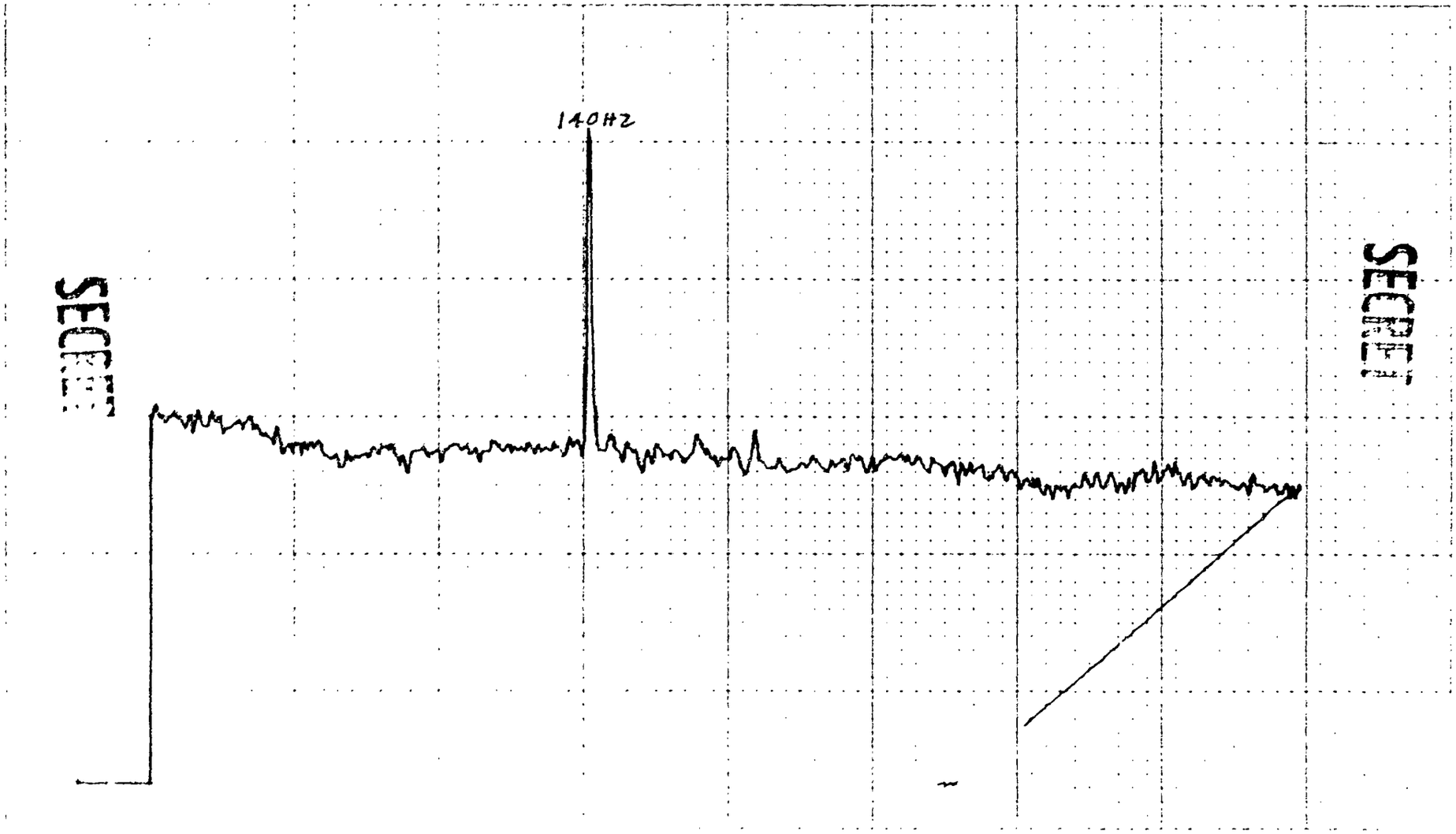
CONTROL: 2-8 -0202 (44)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE:BEARING STAKE
CENTER FREQ: 160 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

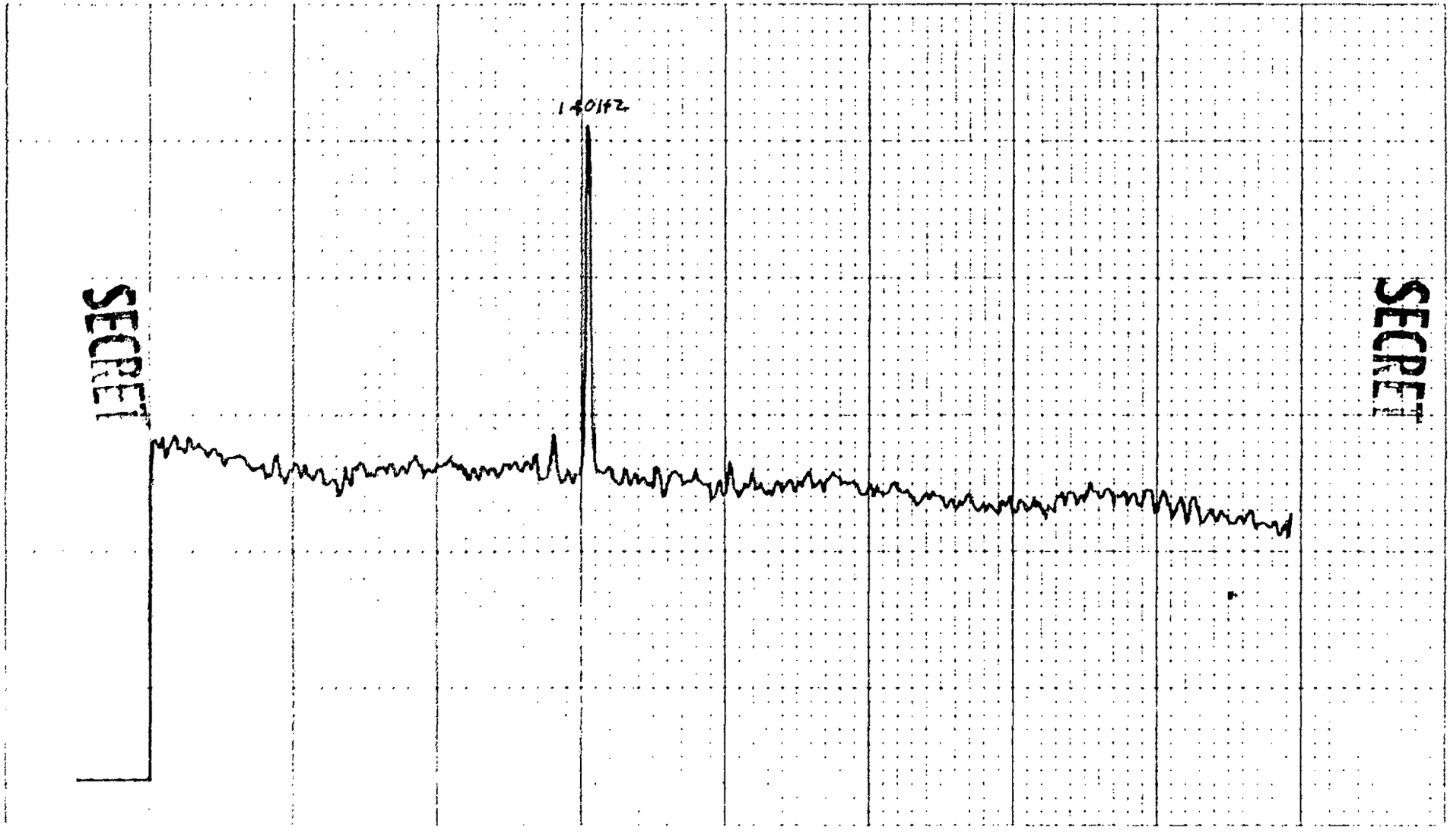
CONTROL: 2-8 -0202 (45)
OMNI SPECTRUM (ELEMENT 39)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



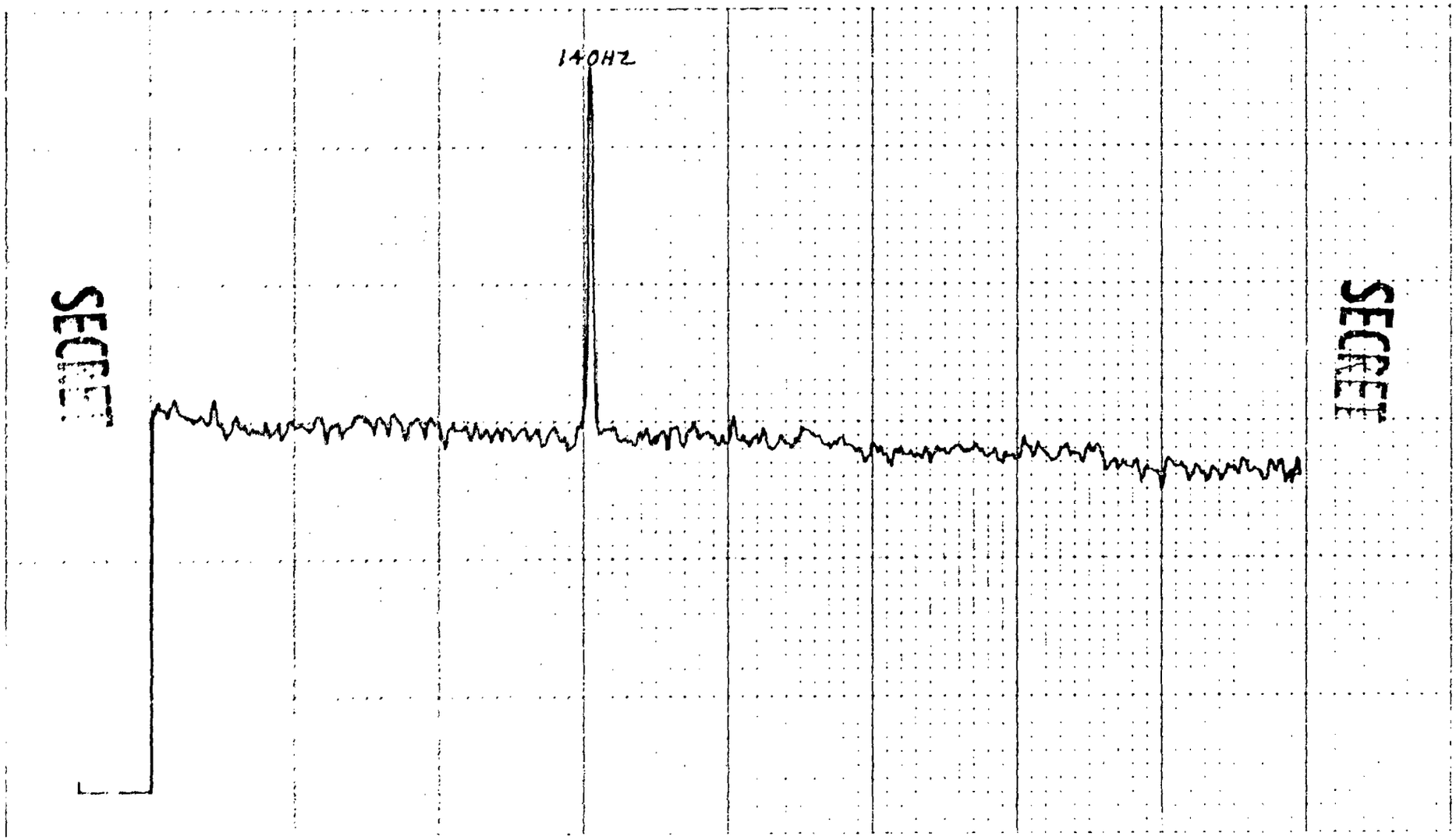
CONTROL: 2-8 -0202 (46)
OMNI SPECTRUM(ELEMENT 41)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

REEL: F29 INDEX 1145

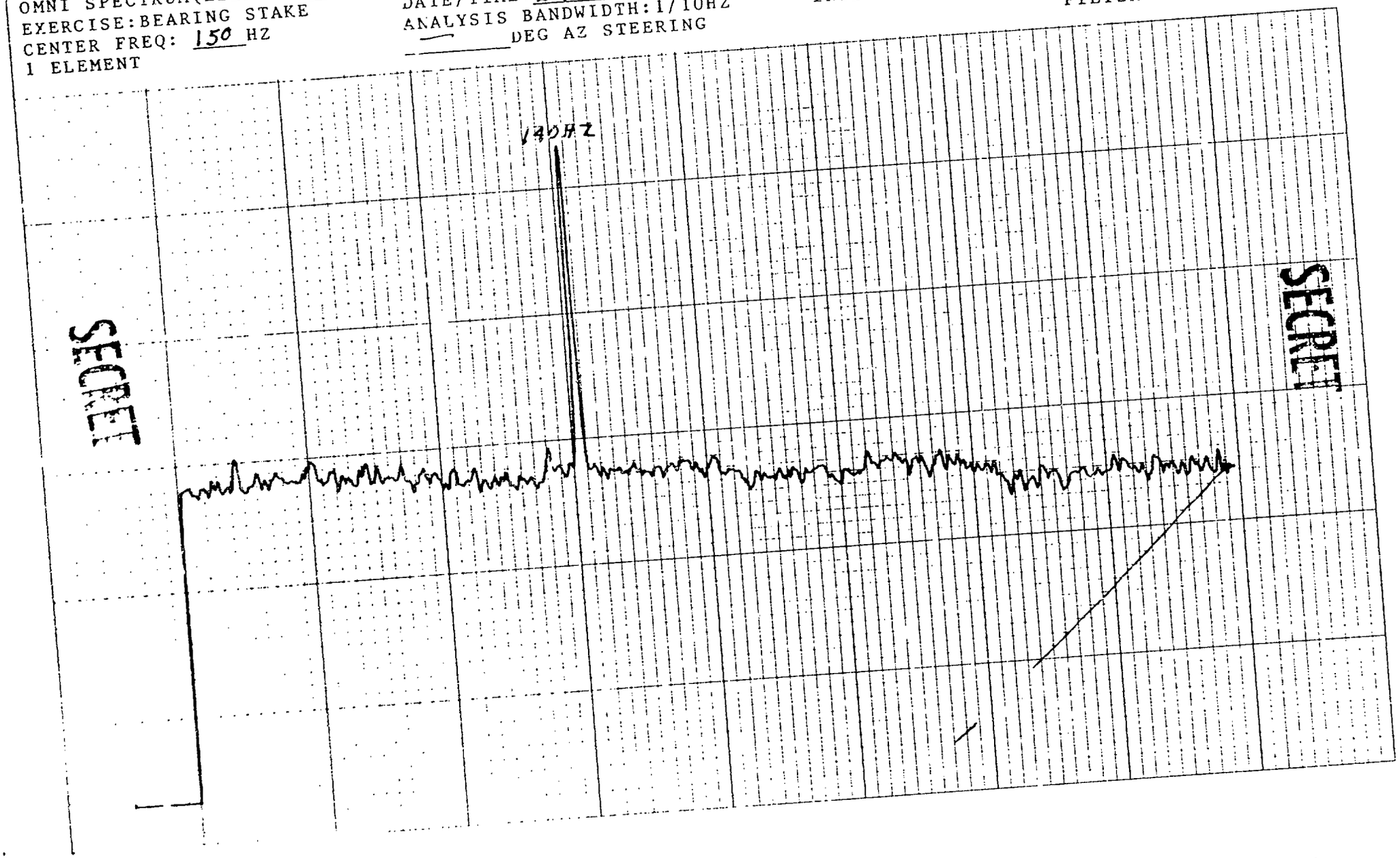
CONTROL: 2-8 -0202 (47)
OMNI SPECTRUM (ELEMENT 43)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

INTEGRATION TIME 320 SECS
FILTER

ATTEN: — DB
WTG: HANNING



46 0703

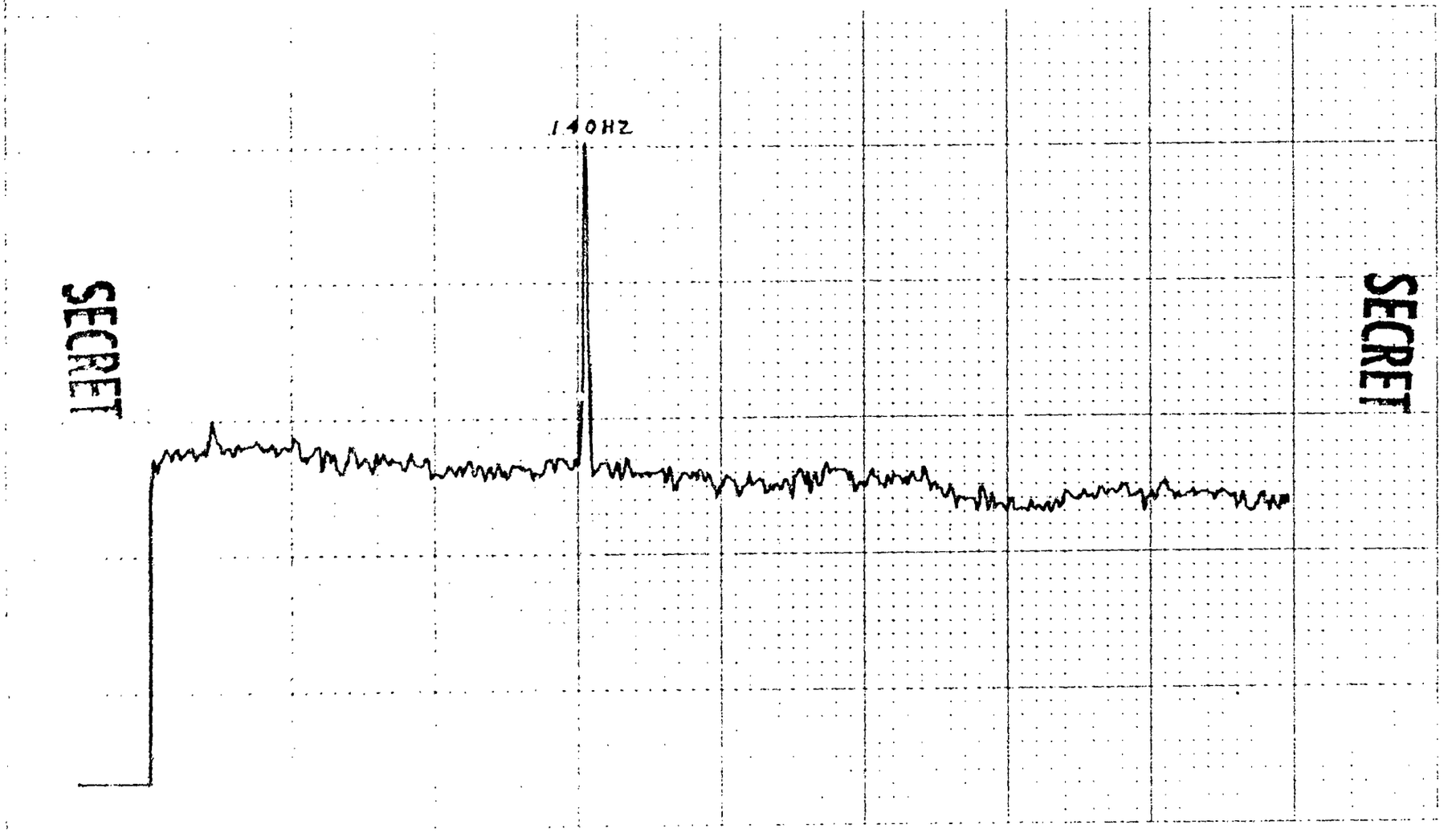
CONTROL: 2-8 -0202 (48)
OMNI SPECTRUM (ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



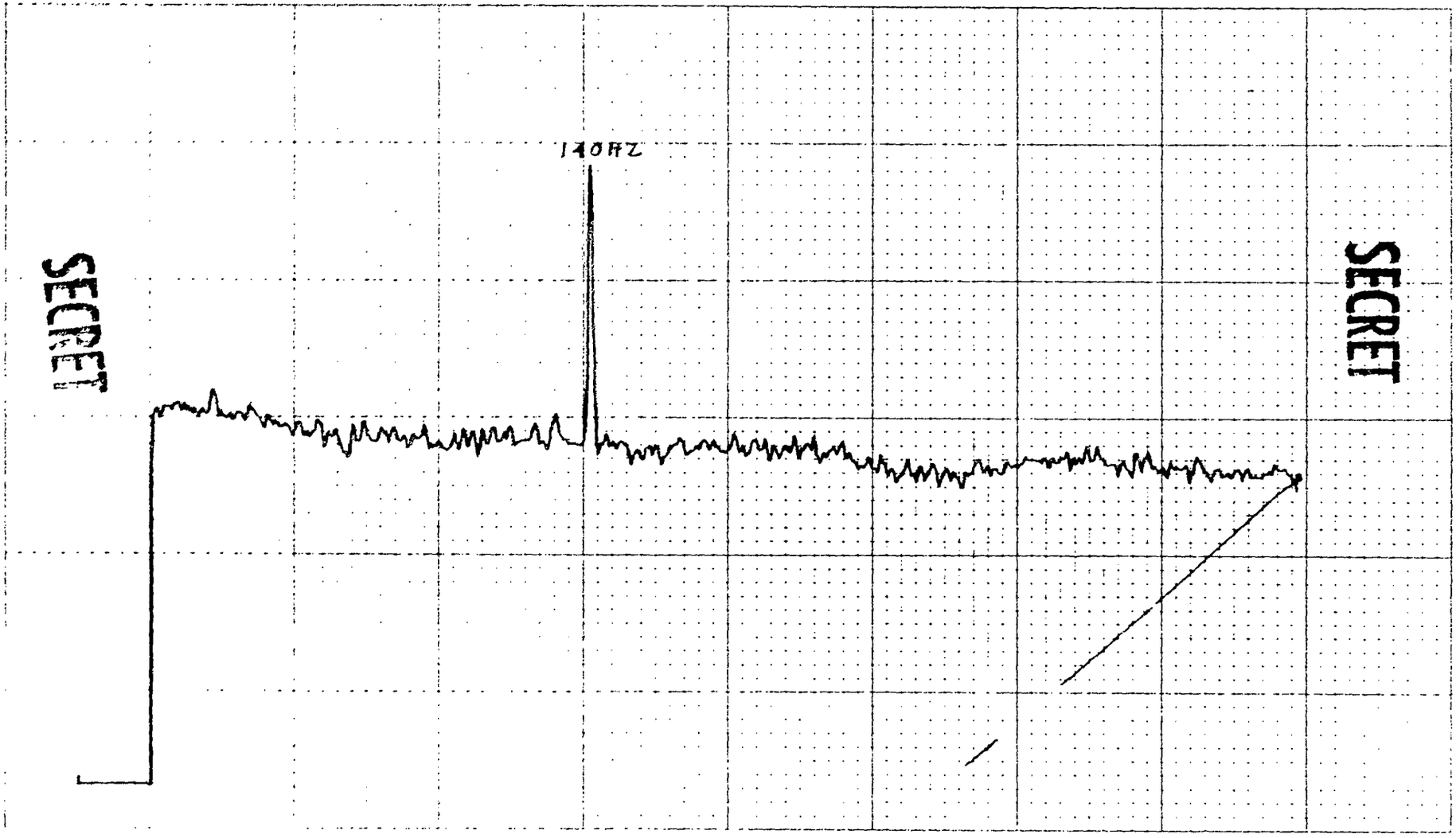
CONTROL: 2-8 -0202 (49)
OMNI SPECTRUM(ELEMENT 47)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

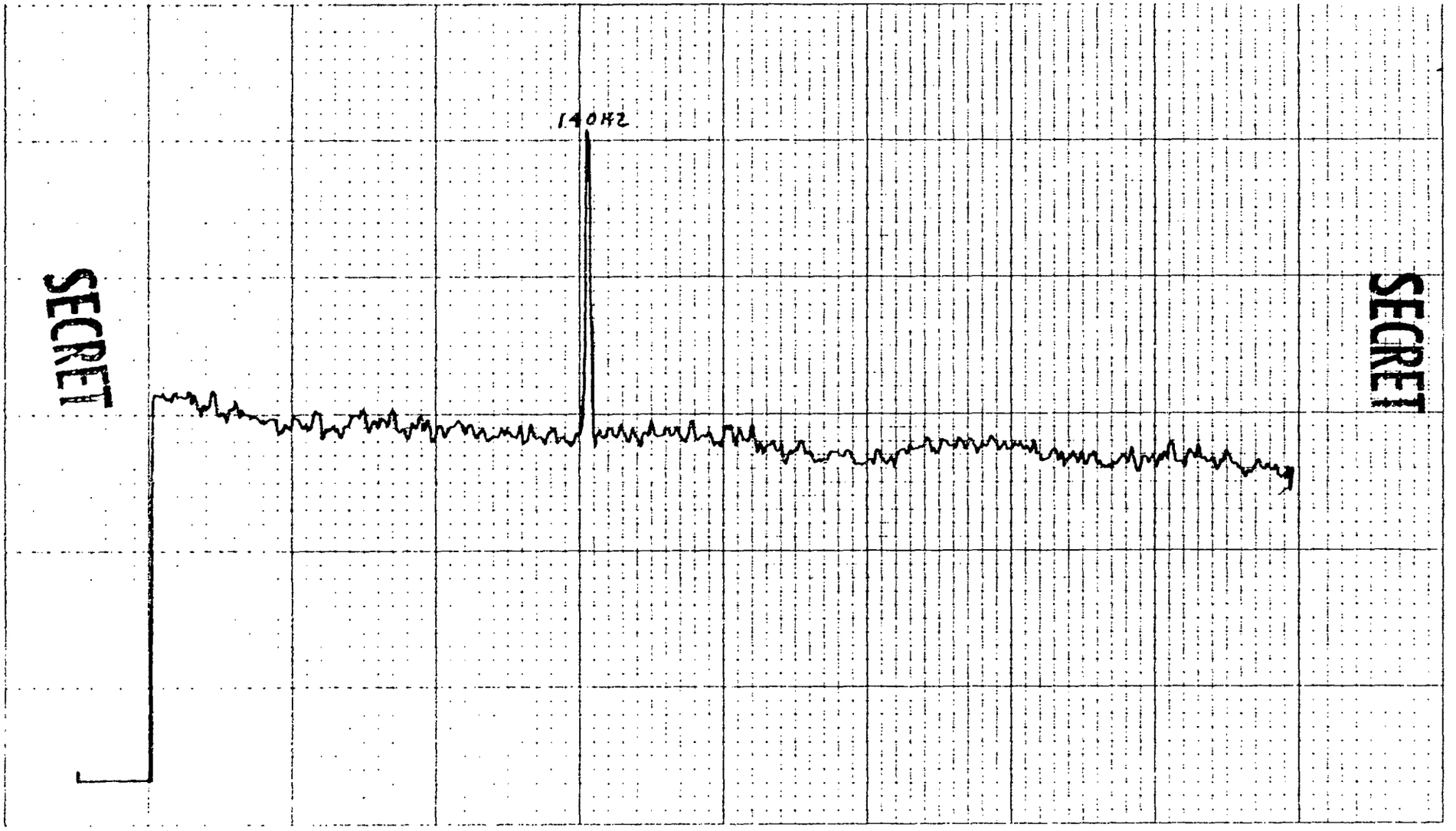
CONTROL: 28 -0202 (50)
OMNI SPECTRUM(ELEMENT 49)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 28-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

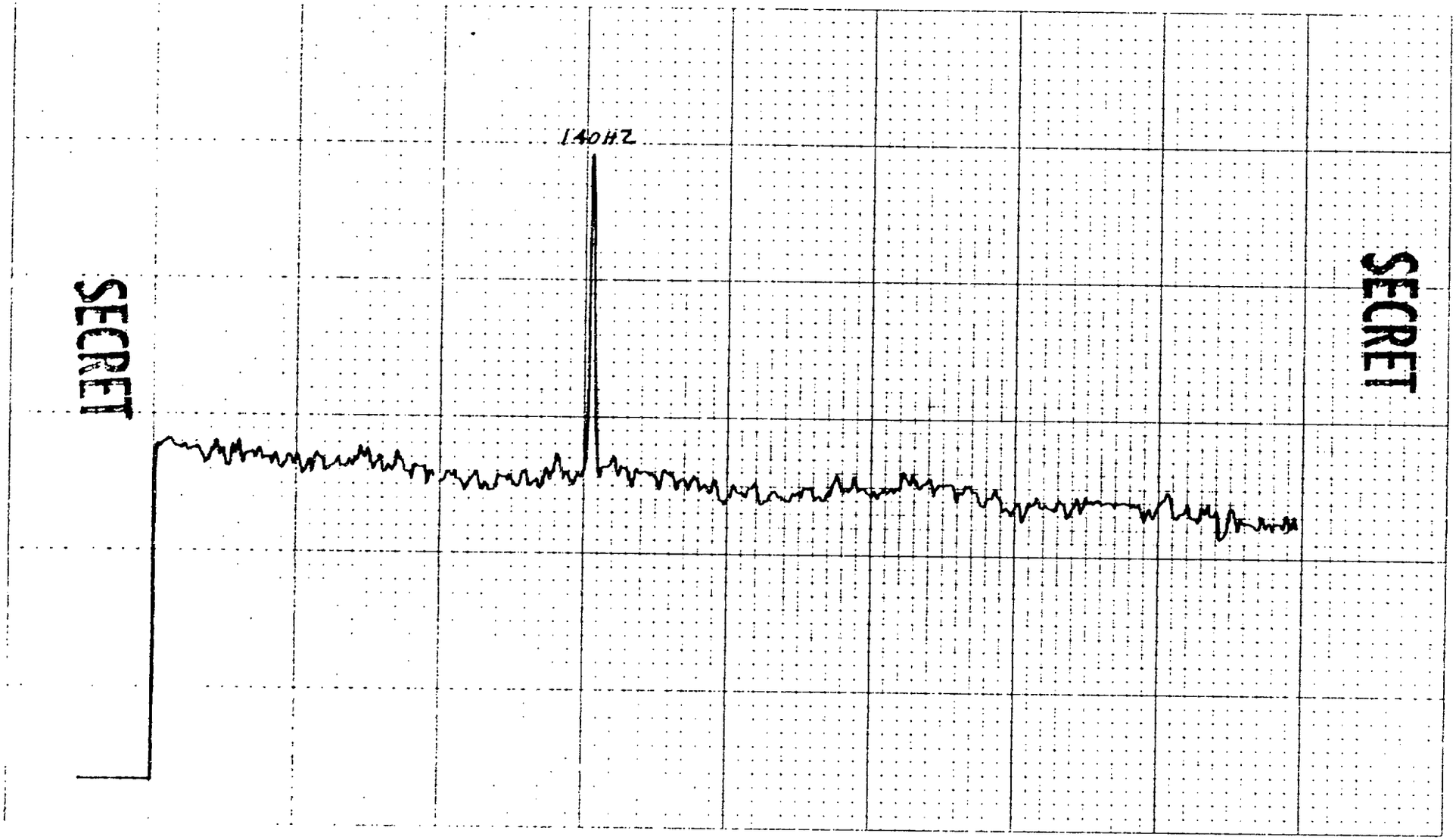
CONTROL: 2-8 -0202 (51)
OMNI SPECTRUM(ELEMENT 51)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1149

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

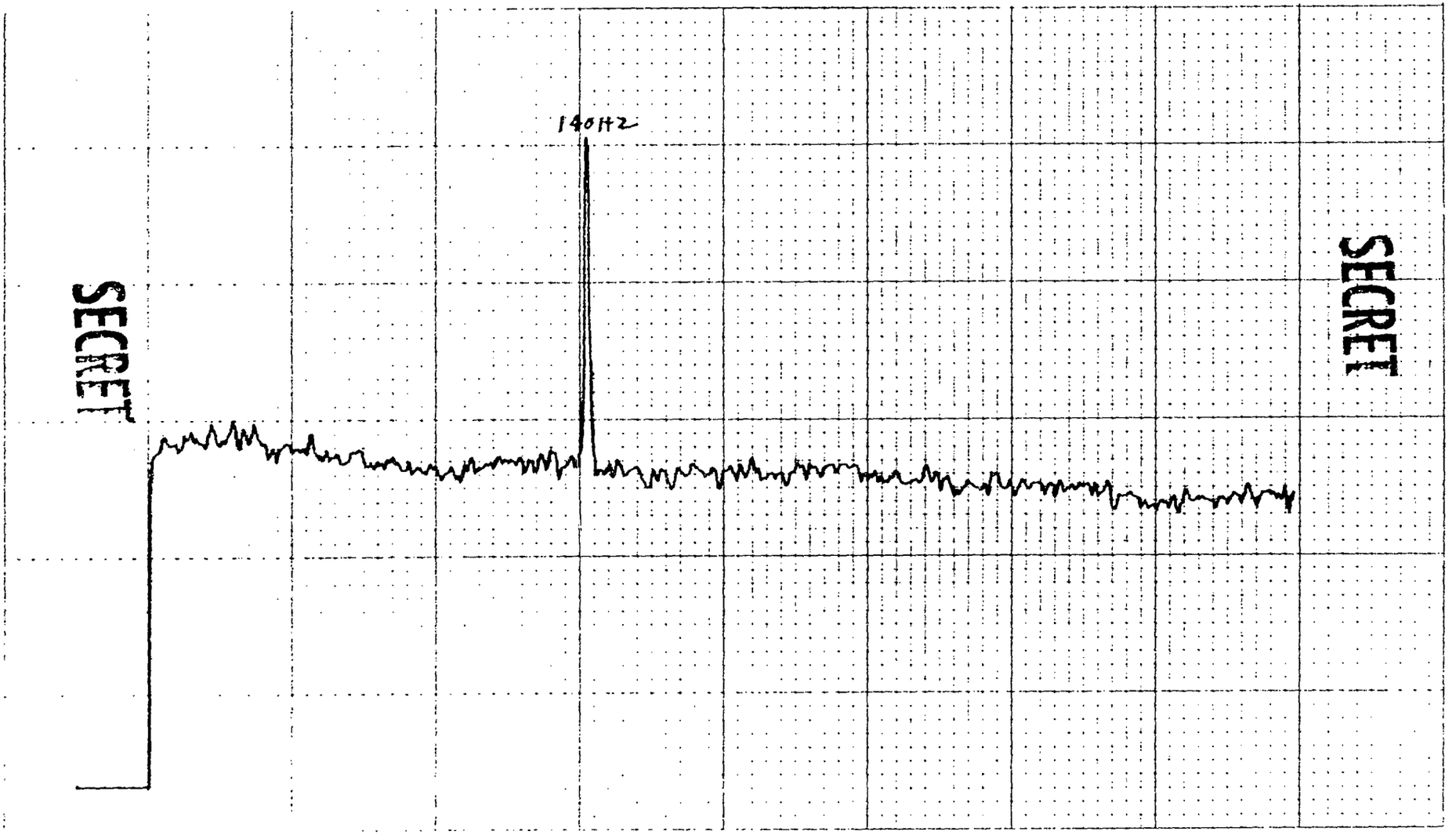
CONTROL: 2-8 -0202 (52)
OMNI SPECTRUM(ELEMENT 53)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

CONTROL: 2-8 -0202 (1)
OMNI SPECTRUM(ELEMENT 2)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

INTEGRATION TIME 320 SECS
FILTER

PEEL: F29 INDEX 1148

ATTEN: — DB
WTG: HANNING

46 0705

REEL: F29 INDEX 1145

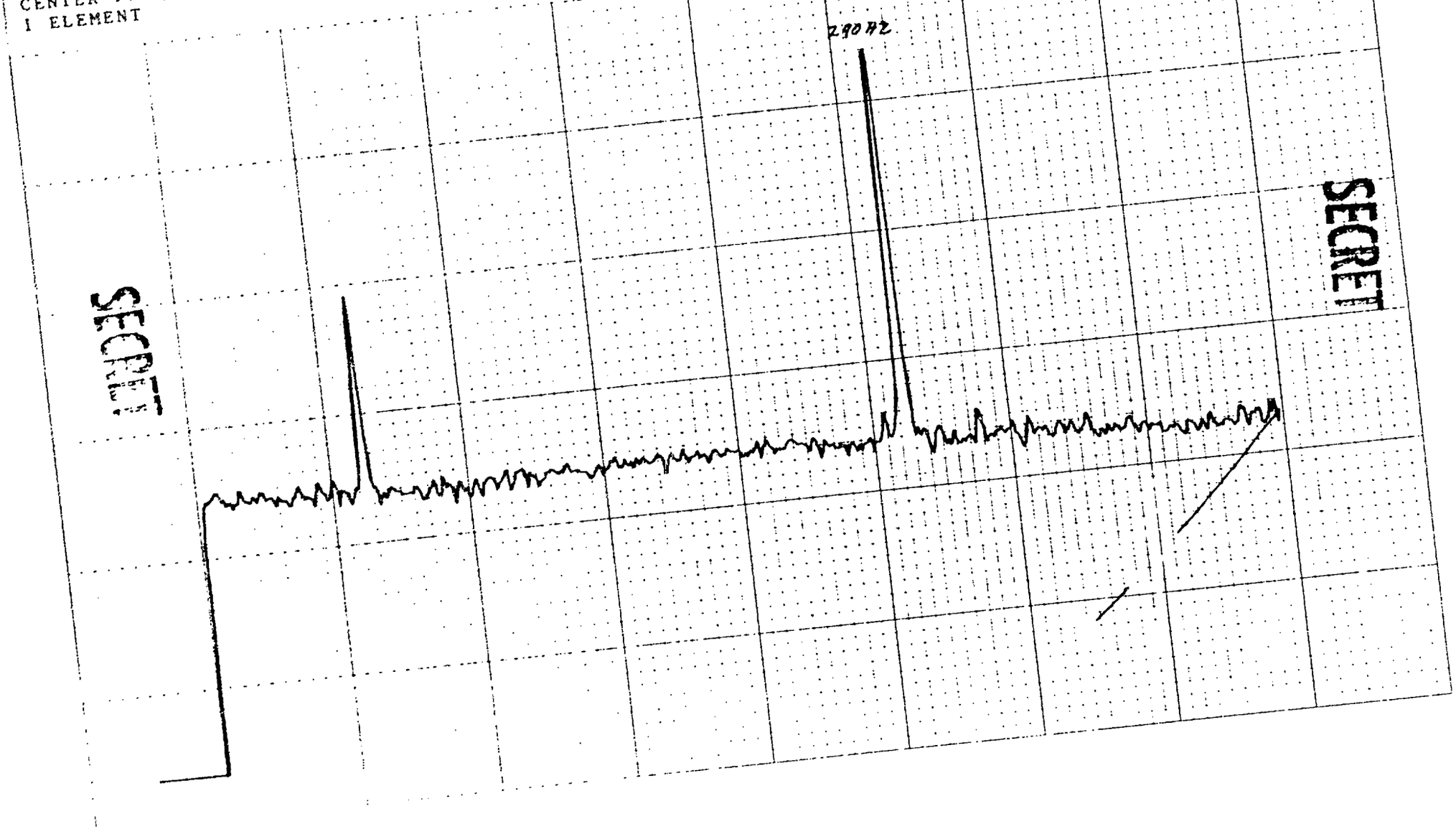
CONTROL: 2-8 -0202 (2)
OMNI SPECTRUM(ELEMENT 4)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
DEG AZ STEERING

INTEGRATION TIME 320 SECS
FILTER

ATTEN: - DB
WTG: HANNING



46 0703

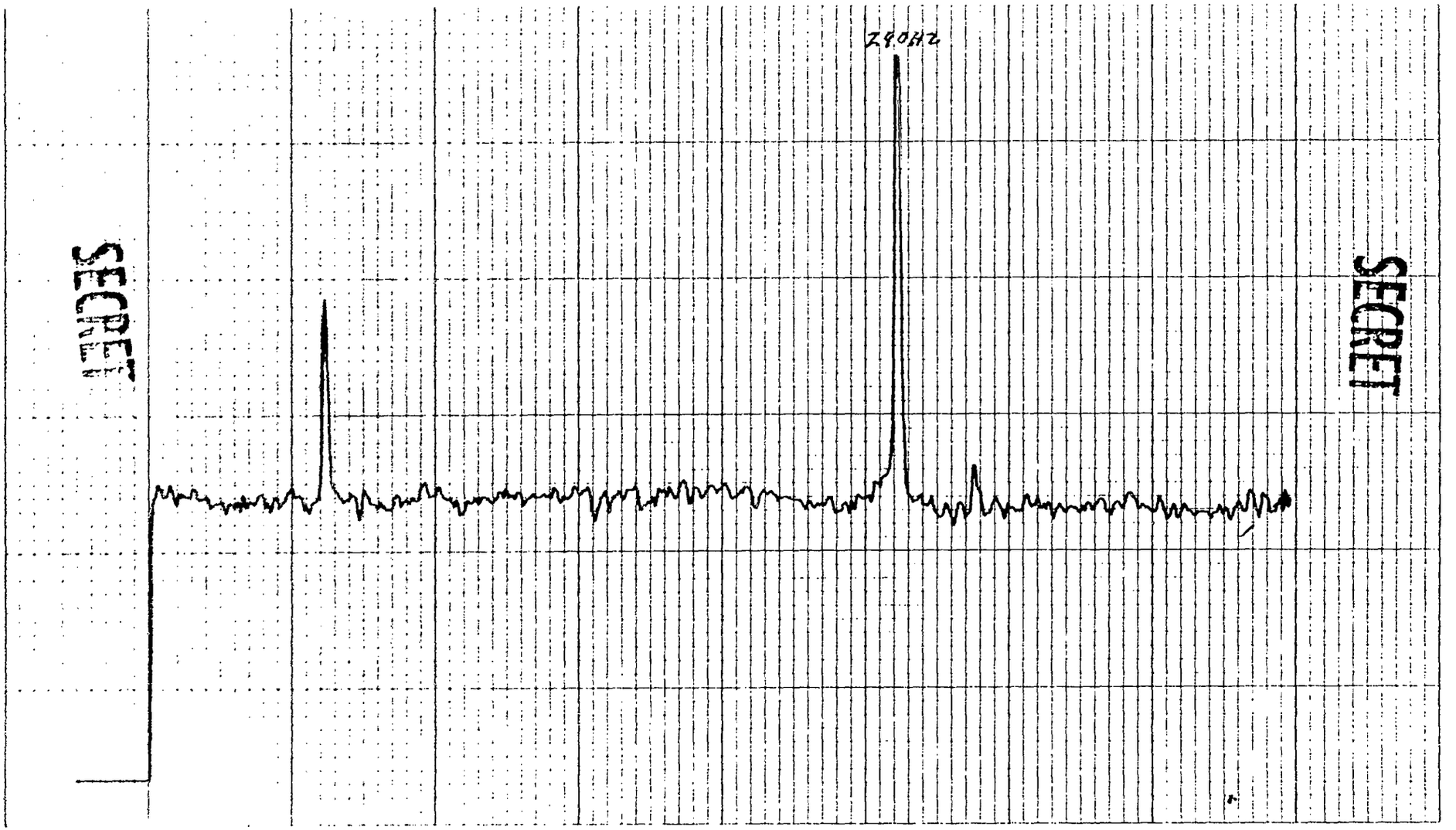
CONTROL: 2-8 -0202 (3)
OMNI SPECTRUM(ELEMENT 6)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

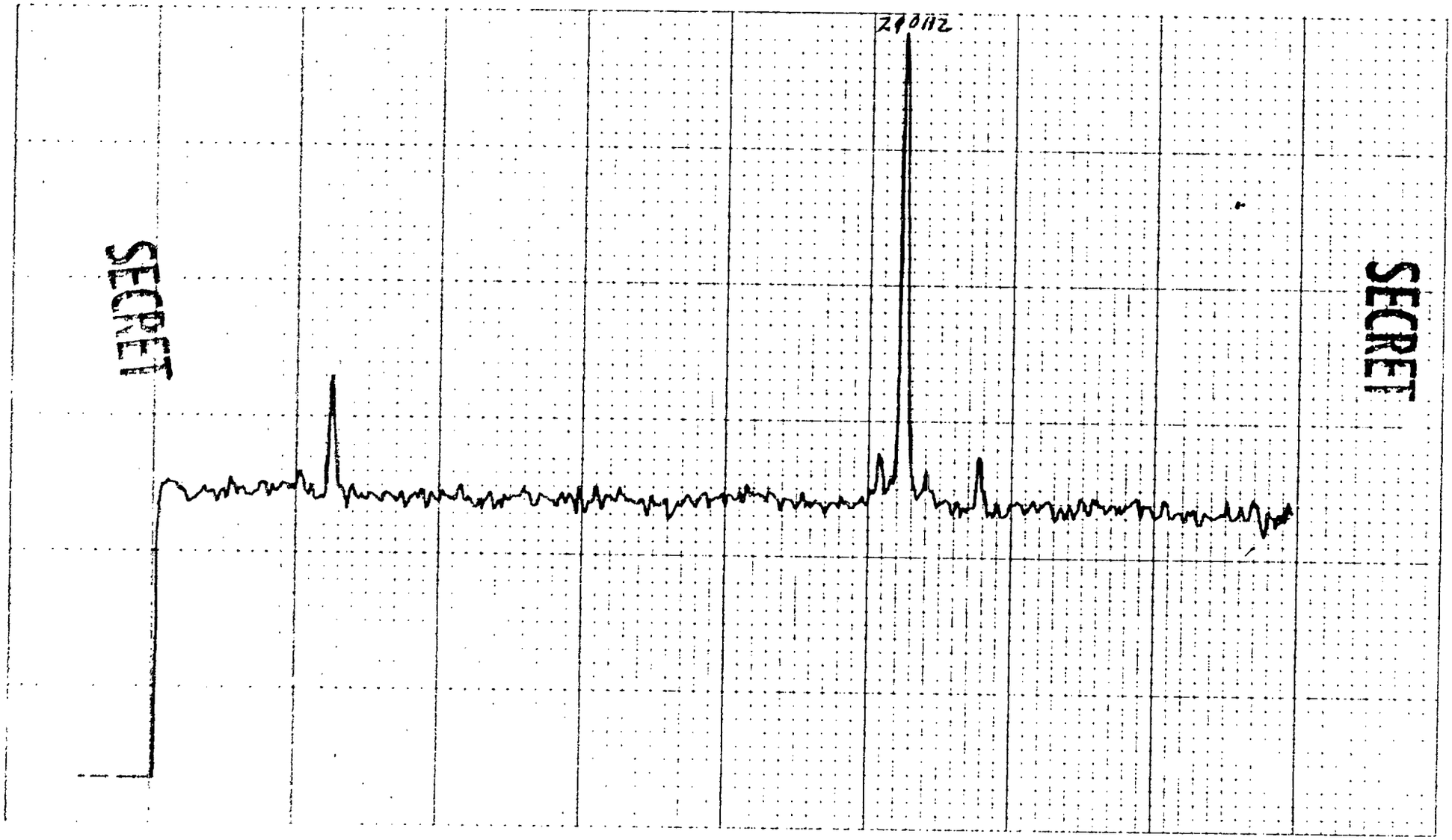
CONTROL: 2-8 -0202 (4)
OMNI SPECTRUM(ELEMENT 9)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



CONTROL: 2-8 -0202 (5)
OMNI SPECTRUM(ELEMENT 10)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

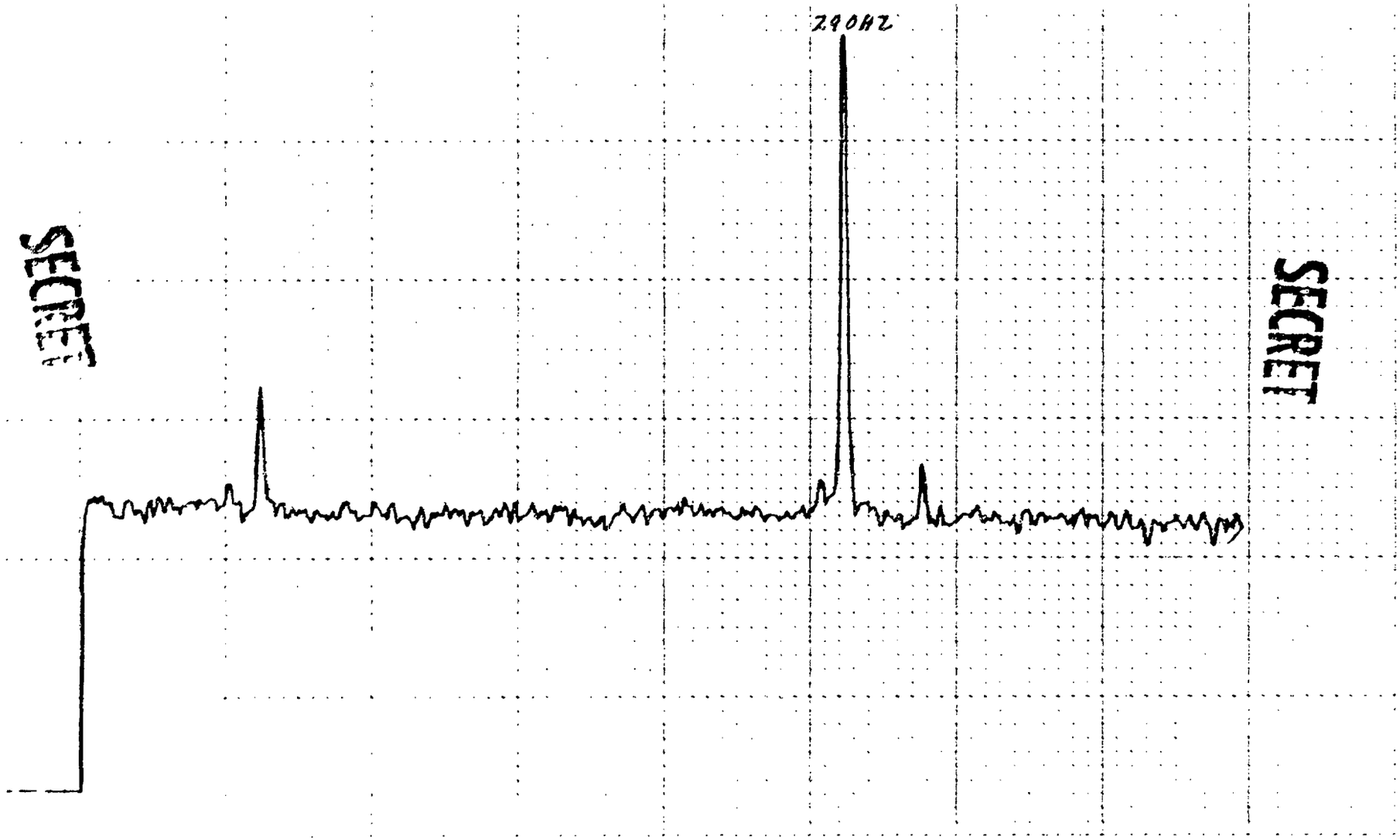
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

INTEGRATION TIME 320 SECS
FILTER

REEL: F29

INDEX 1145

ATTEN: — DB
WTG: HANNING



CONTROL: 2-8 -0202 (6)
OMNI SPECTRUM(ELEMENT 12)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

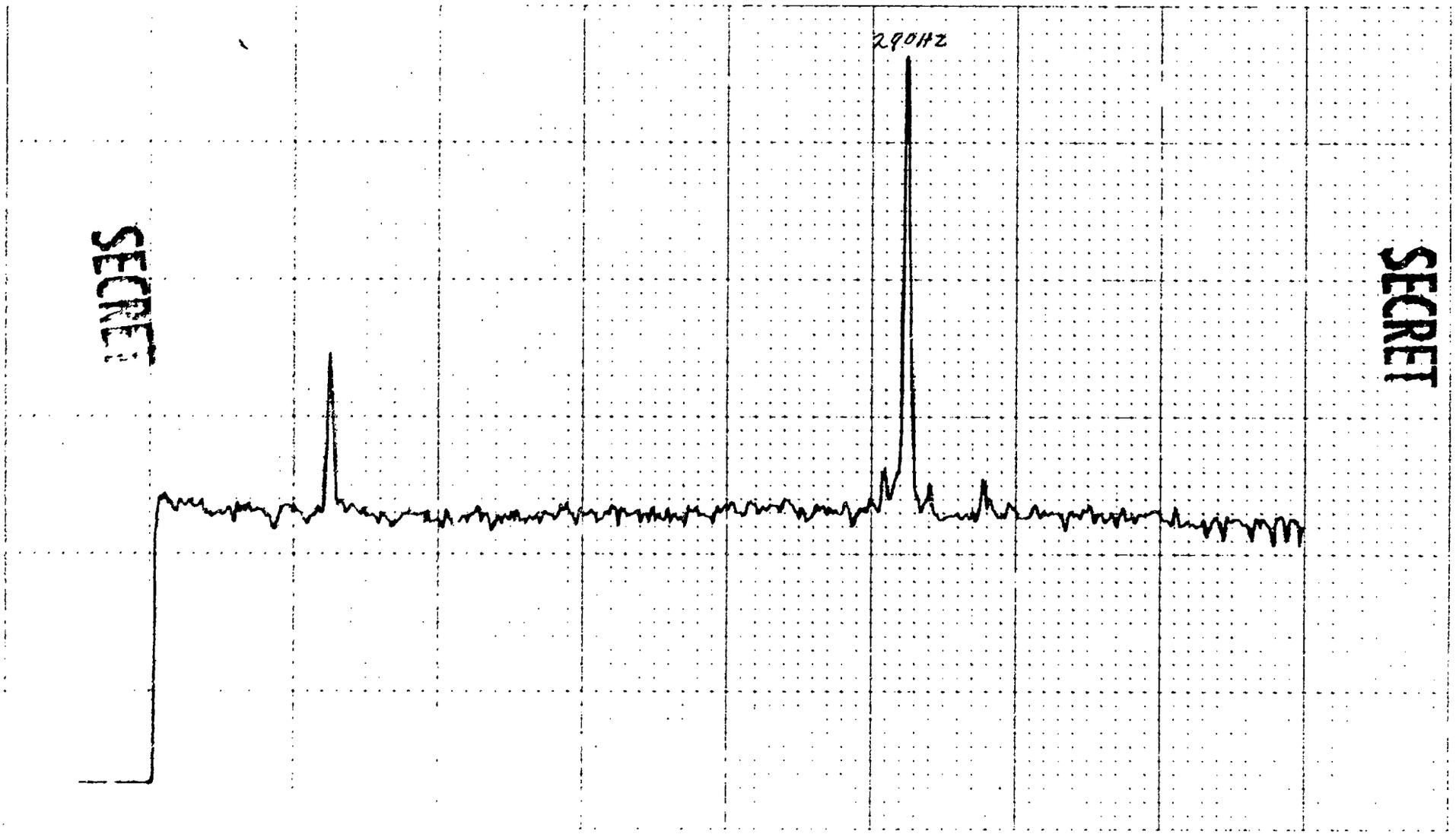
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: F29

INDEX 1145

INTEGRATION TIME 320 SECS

ATTEN: — DB
FILTER WTG: HANNING



46 0703

CONTROL: 2-8 -0202 (7)
OMNI SPECTRUM(ELEMENT 14)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

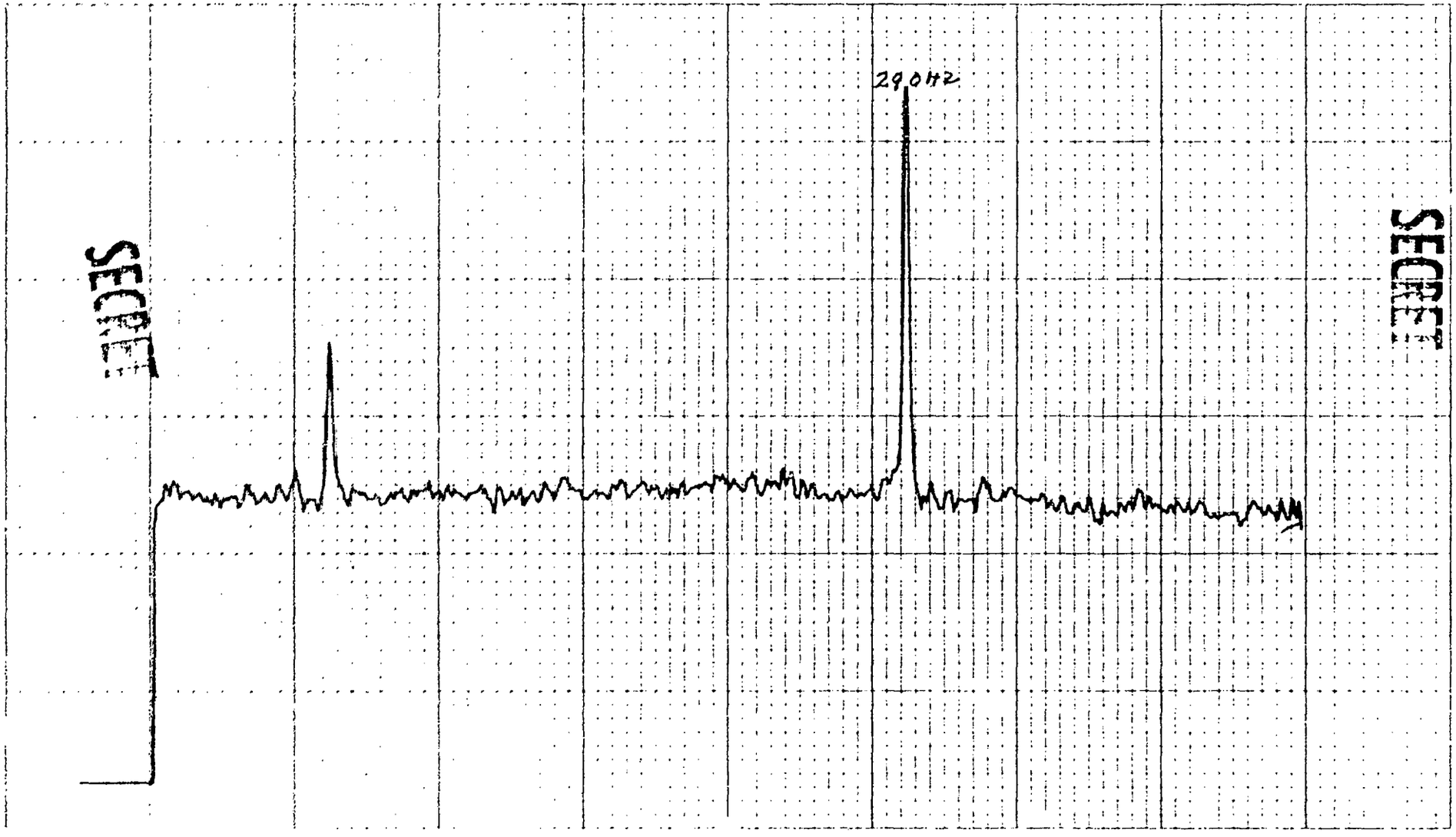
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: F29

INDEX 1145

INTEGRATION TIME 320 SECS
FILTER

ATTEN: — DB
WTG: HANNING



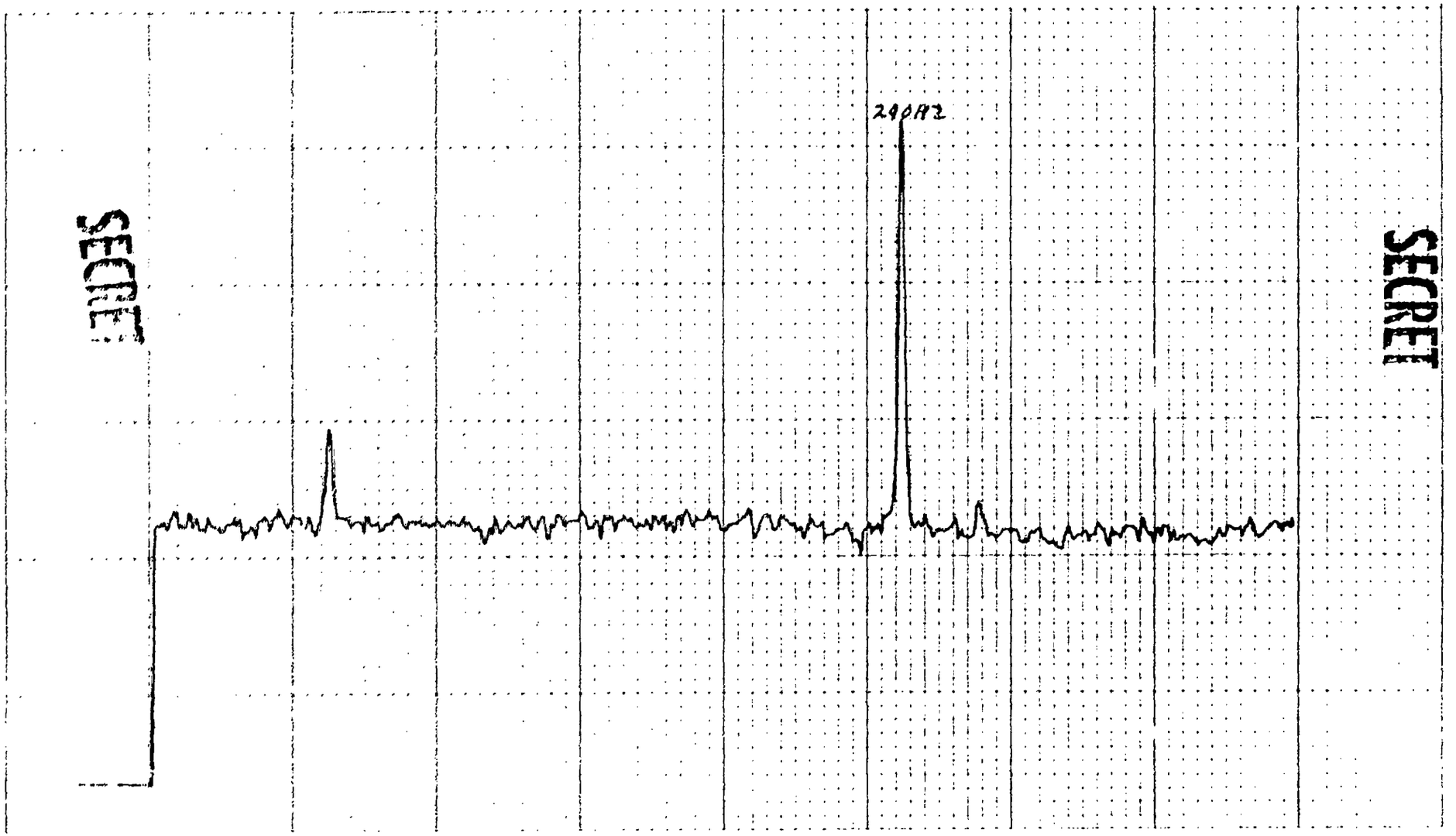
CONTROL: 2-8 -0202 (8)
OMNI SPECTRUM(ELEMENT 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



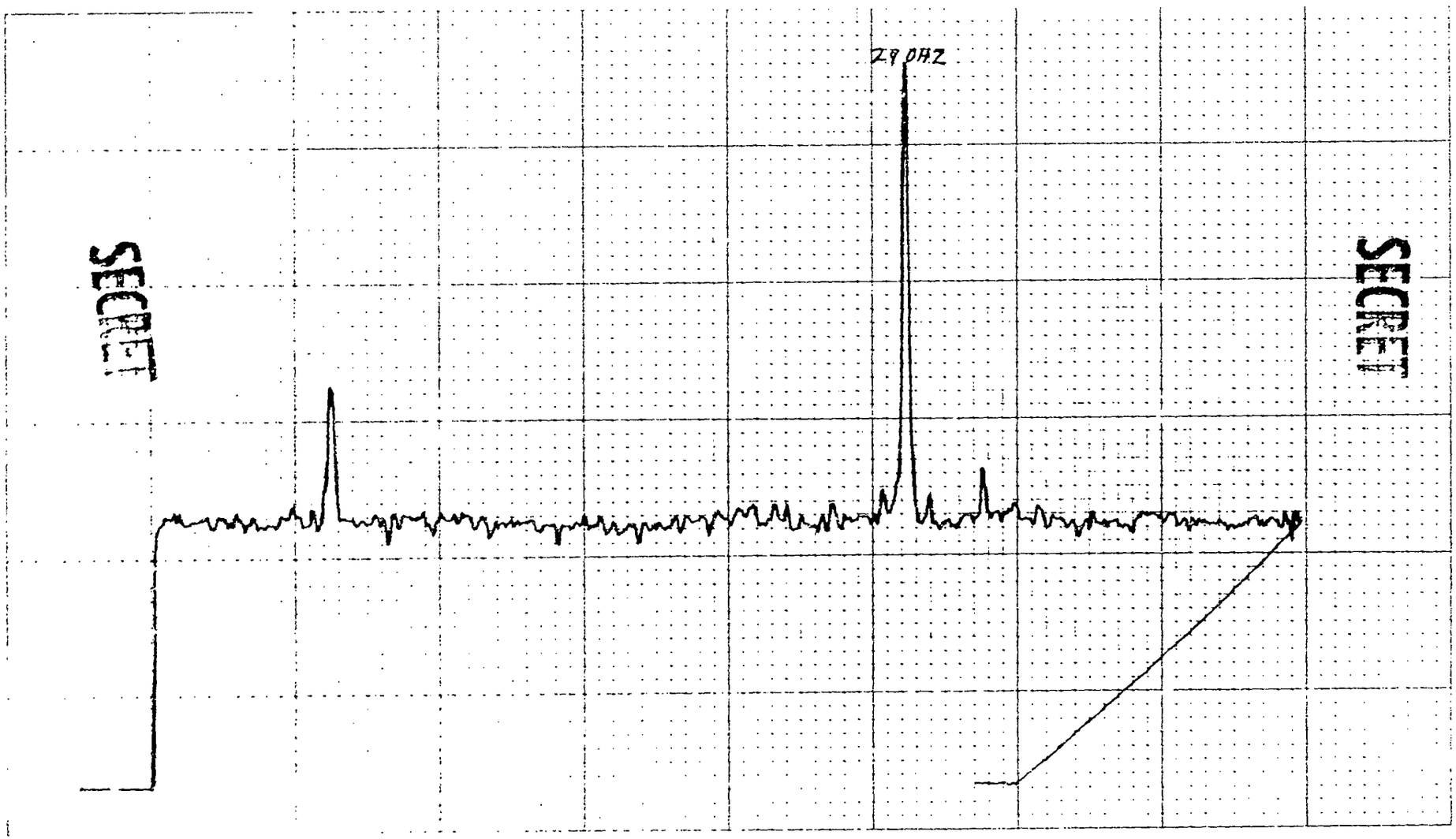
CONTROL: 2-8 -0202 (9)
OMNI SPECTRUM(ELEMENT 19)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

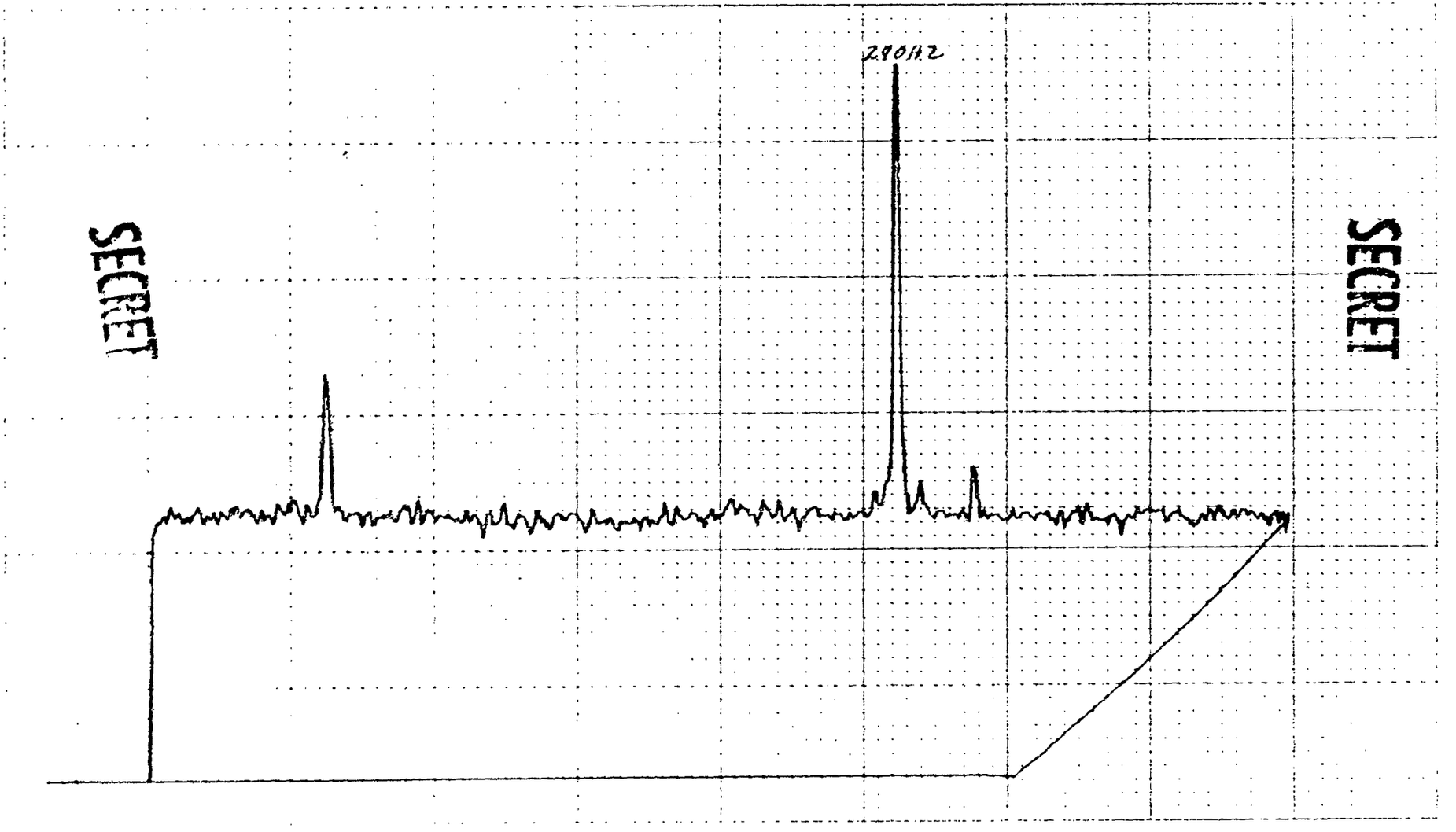
CONTROL: 2-8 -0202 (10)
OMNI SPECTRUM (ELEMENT 20)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX: 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

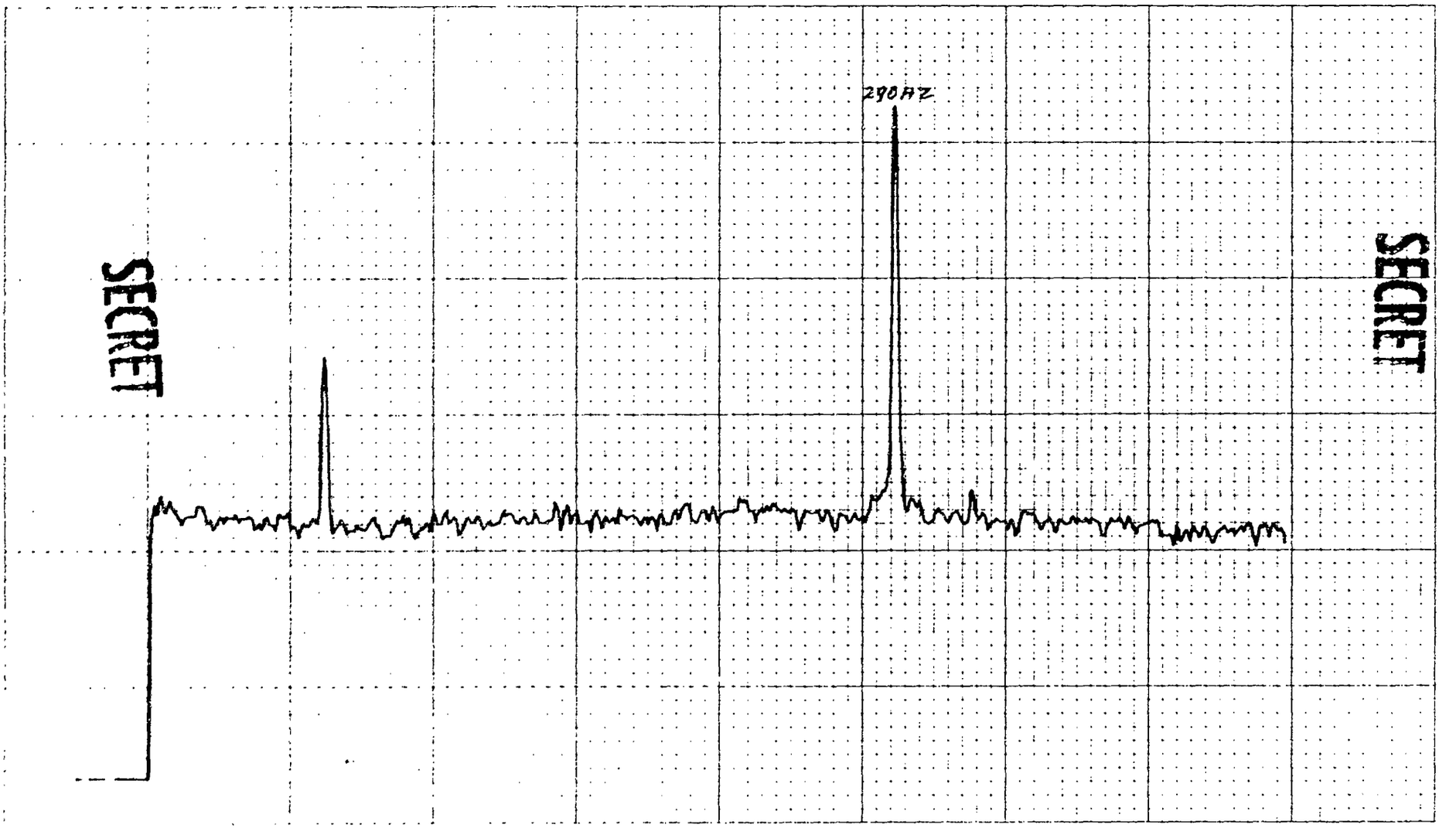
CONTROL: 28 -0202 (11)
OMNI SPECTRUM(ELEMENT 23)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 28-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

CONTROL: 2-8 -0202 (12)
OMNI SPECTRUM(ELEMENT 24)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

CONTROL: 2-8 -0202 (13)
OMNI SPECTRUM(ELEMENT 26)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

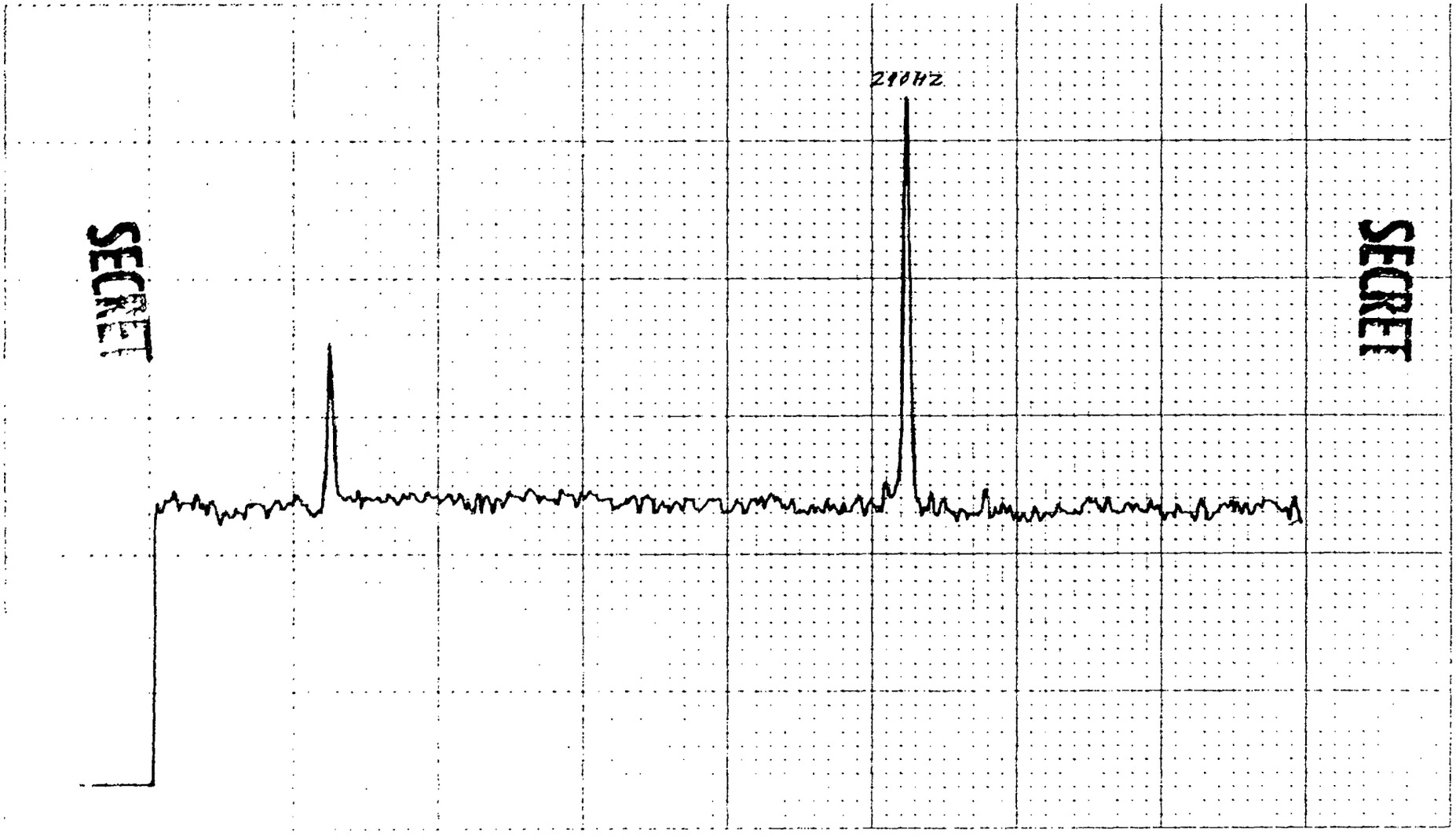
CONTROL: 2-8 -0202 (14)
OMNI SPECTRUM(ELEMENT 29)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH:1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

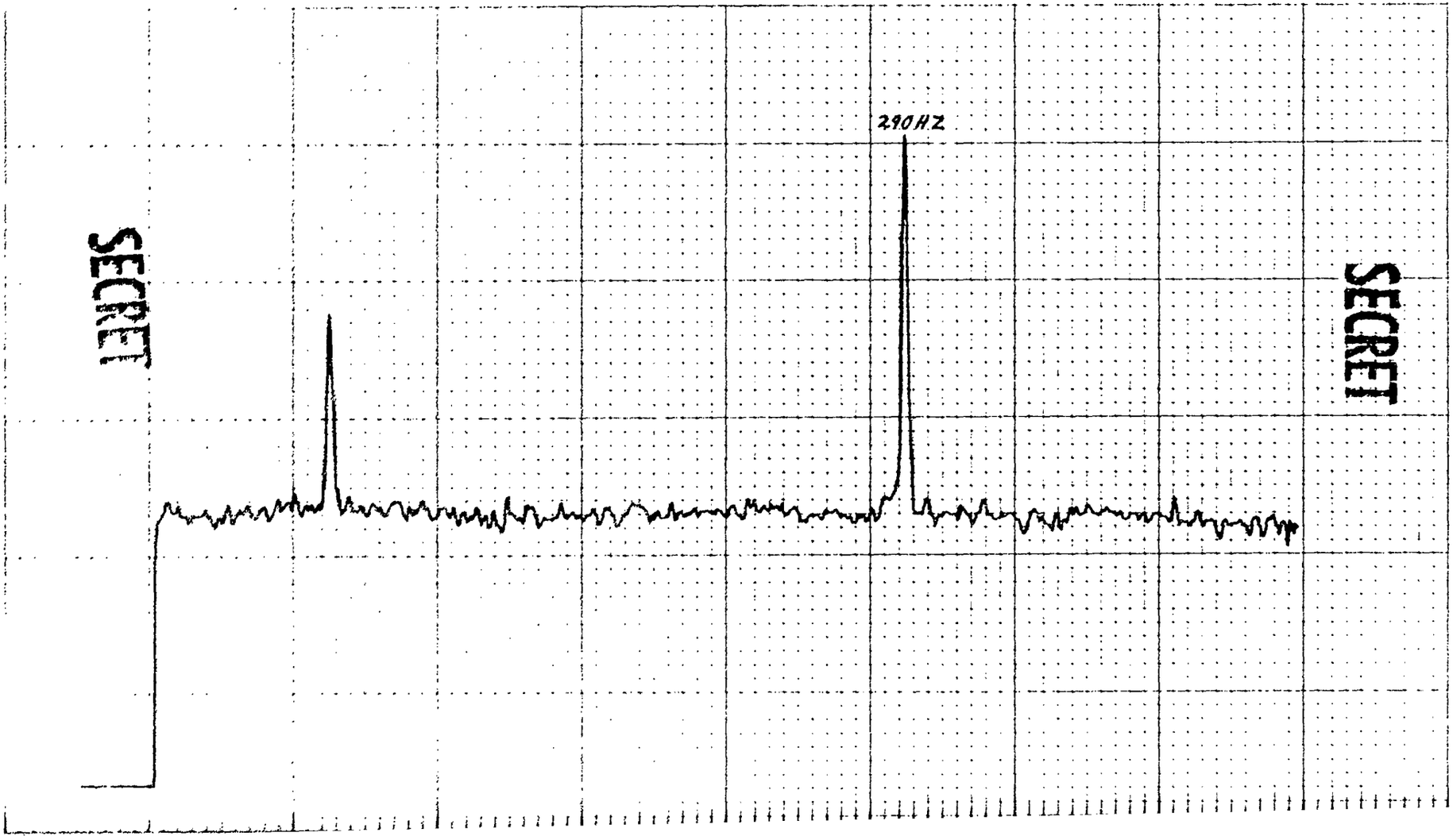
CONTROL: 0202 - 51 (D#7)
OMNI SPECTRUM (ELEMENT 31)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
- DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



46 0703

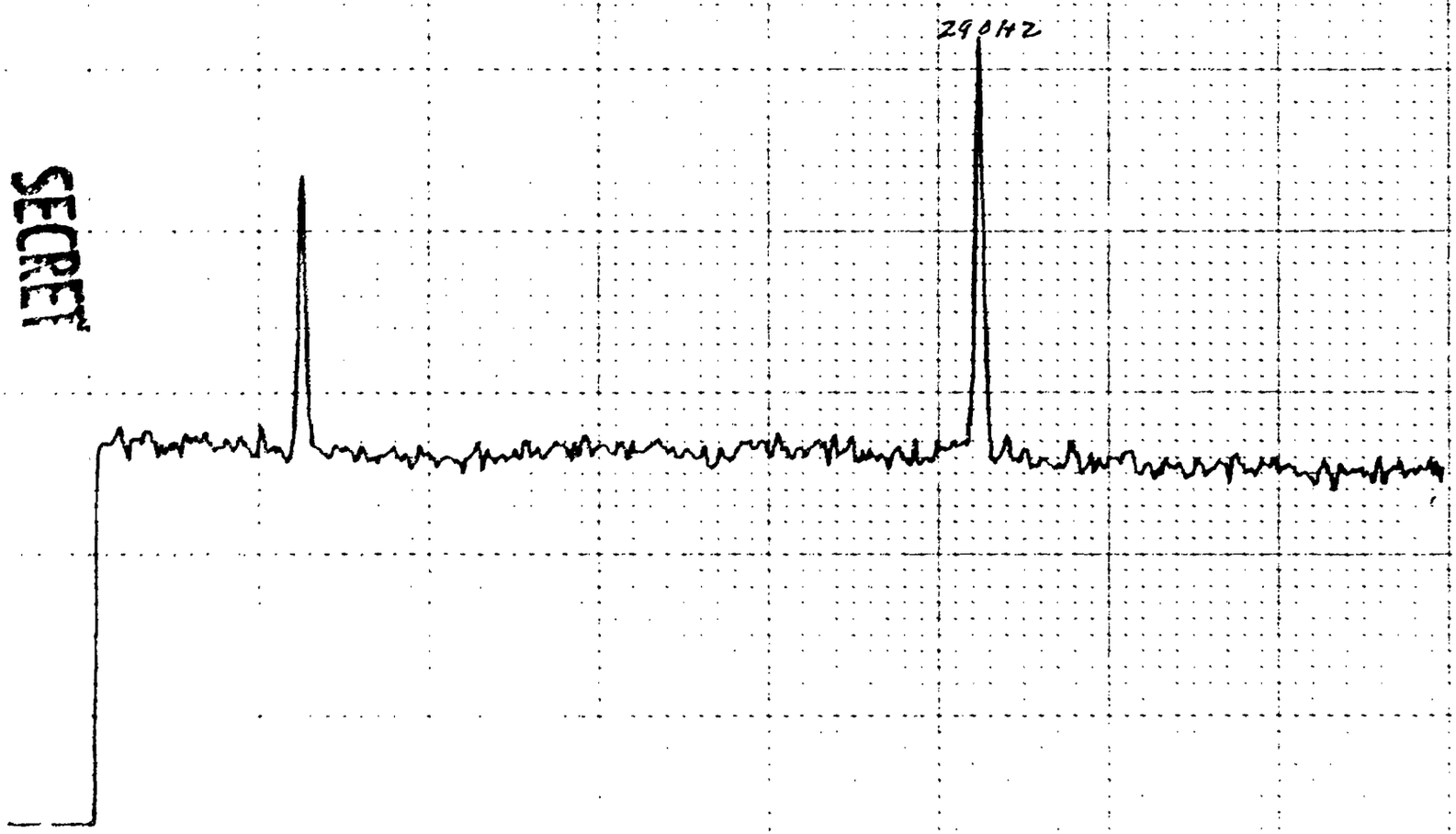
CONTROL: 2-8 -0202 (16)
OMNI SPECTRUM(ELEMENT 33)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

SECRET

46 0703

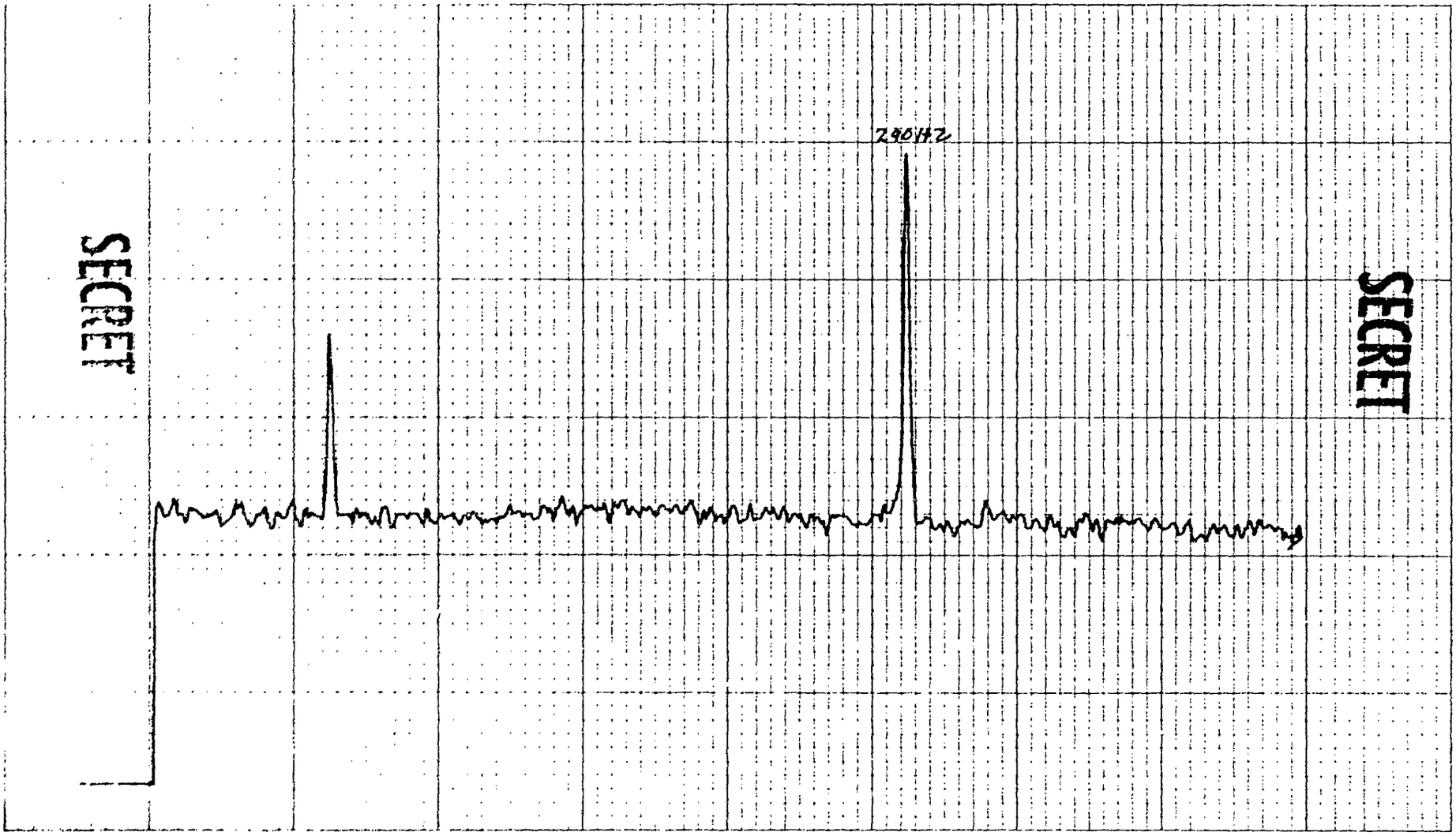
CONTROL: 2-8 -0202 (17)
OMNI SPECTRUM(ELEMENT 35)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
___ DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: – DB
FILTER WTG: HANNING



K+E

46 0703

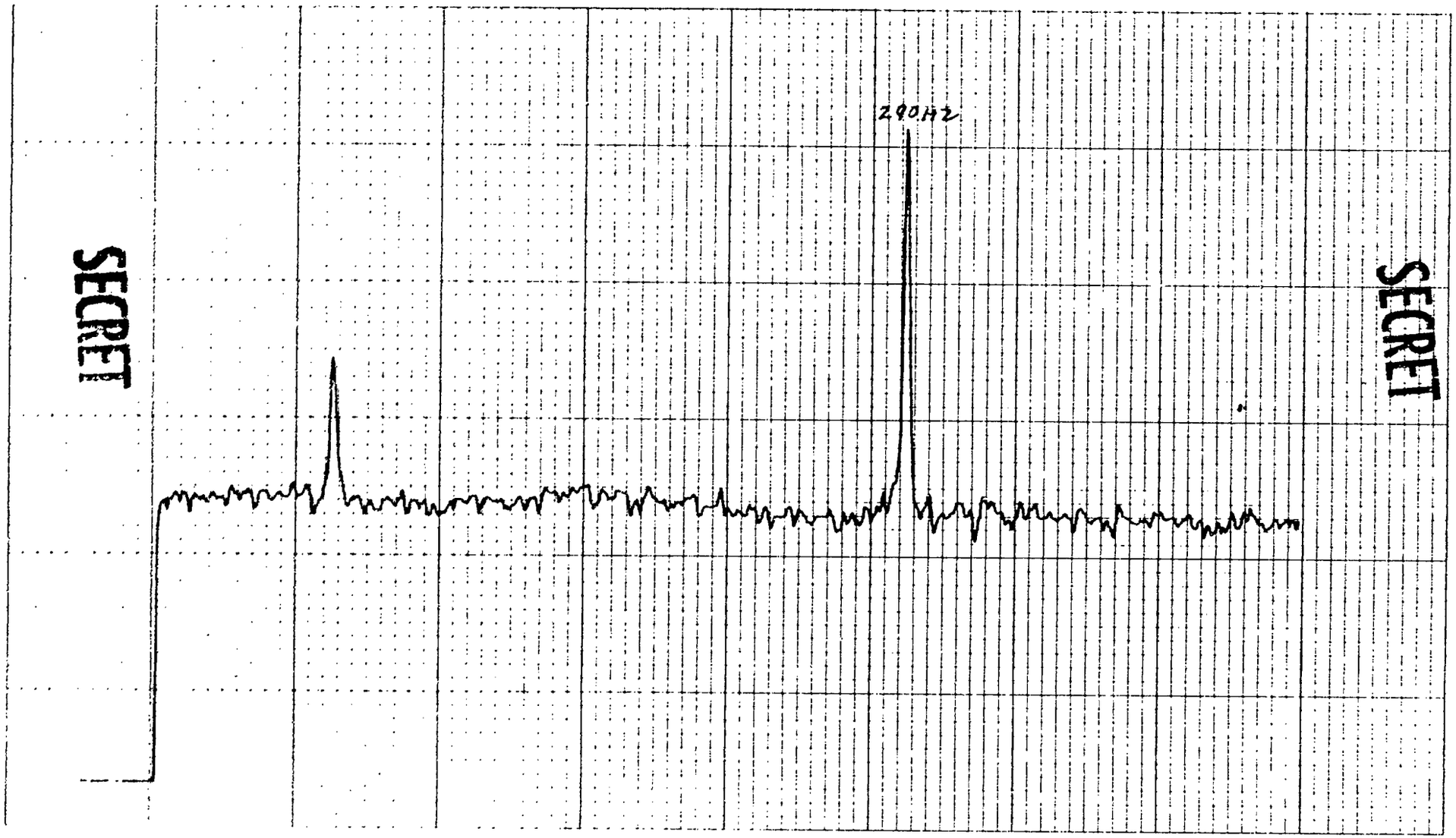
CONTROL: 2-8 -0202 (18)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

CONTROL: 2-8 -0202 (19)
OMNI SPECTRUM(ELEMENT 39)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH:1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

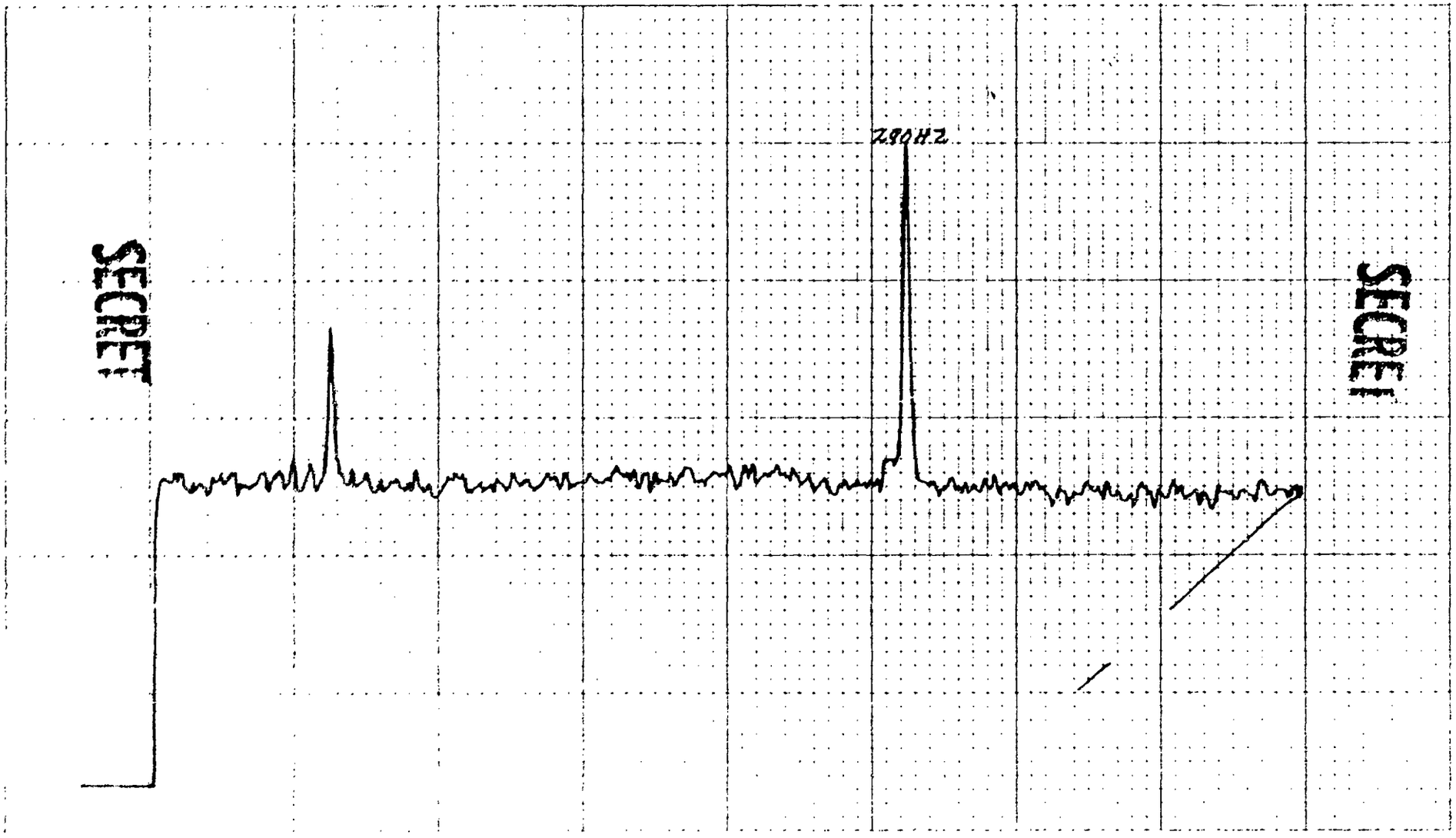
CONTROL: 2-8 -0202 (20)
OMNI SPECTRUM (ELEMENT 41)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



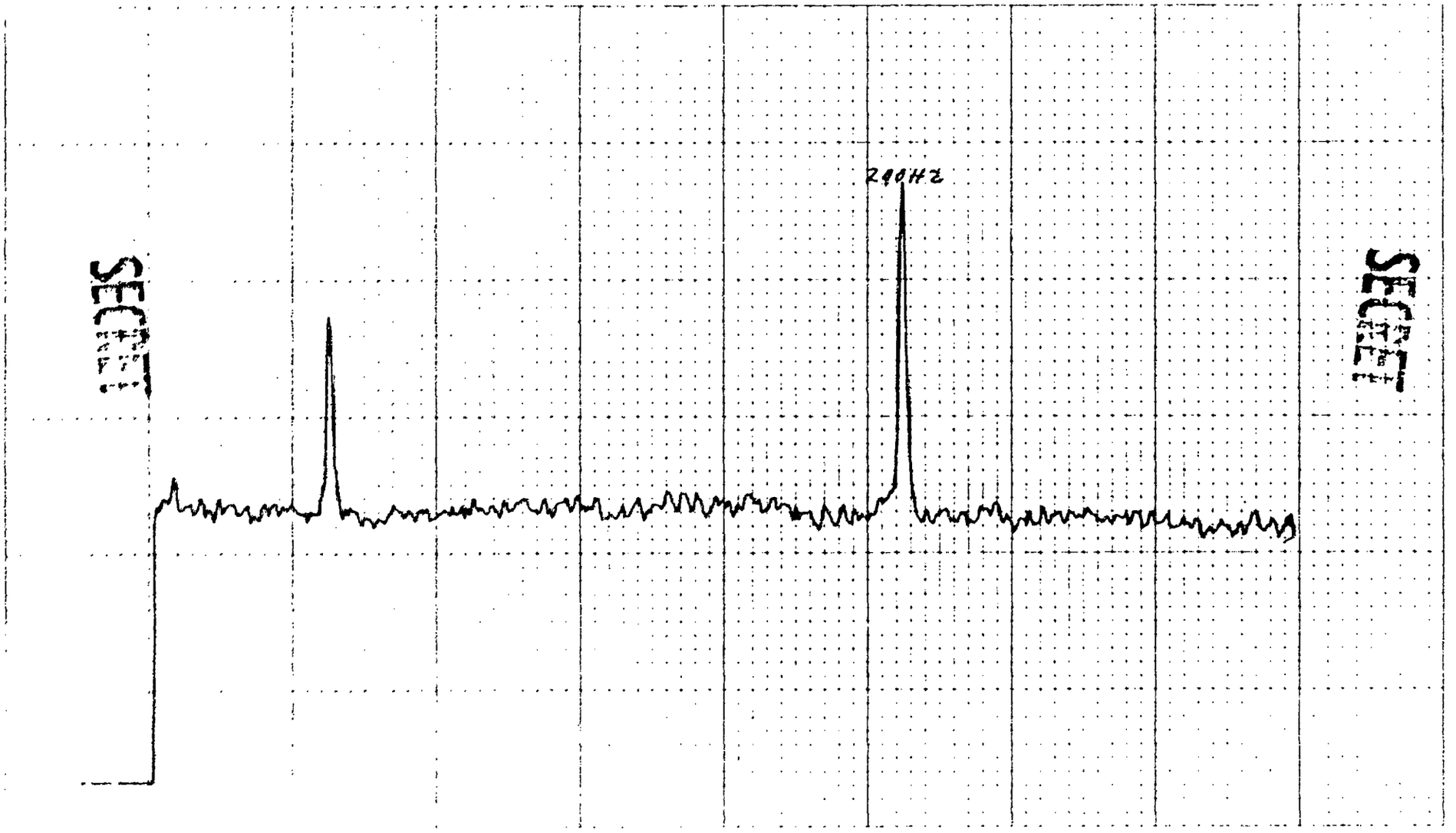
CONTROL: 2-8 -0202 (21)
OMNI SPECTRUM(ELEMENT 43)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

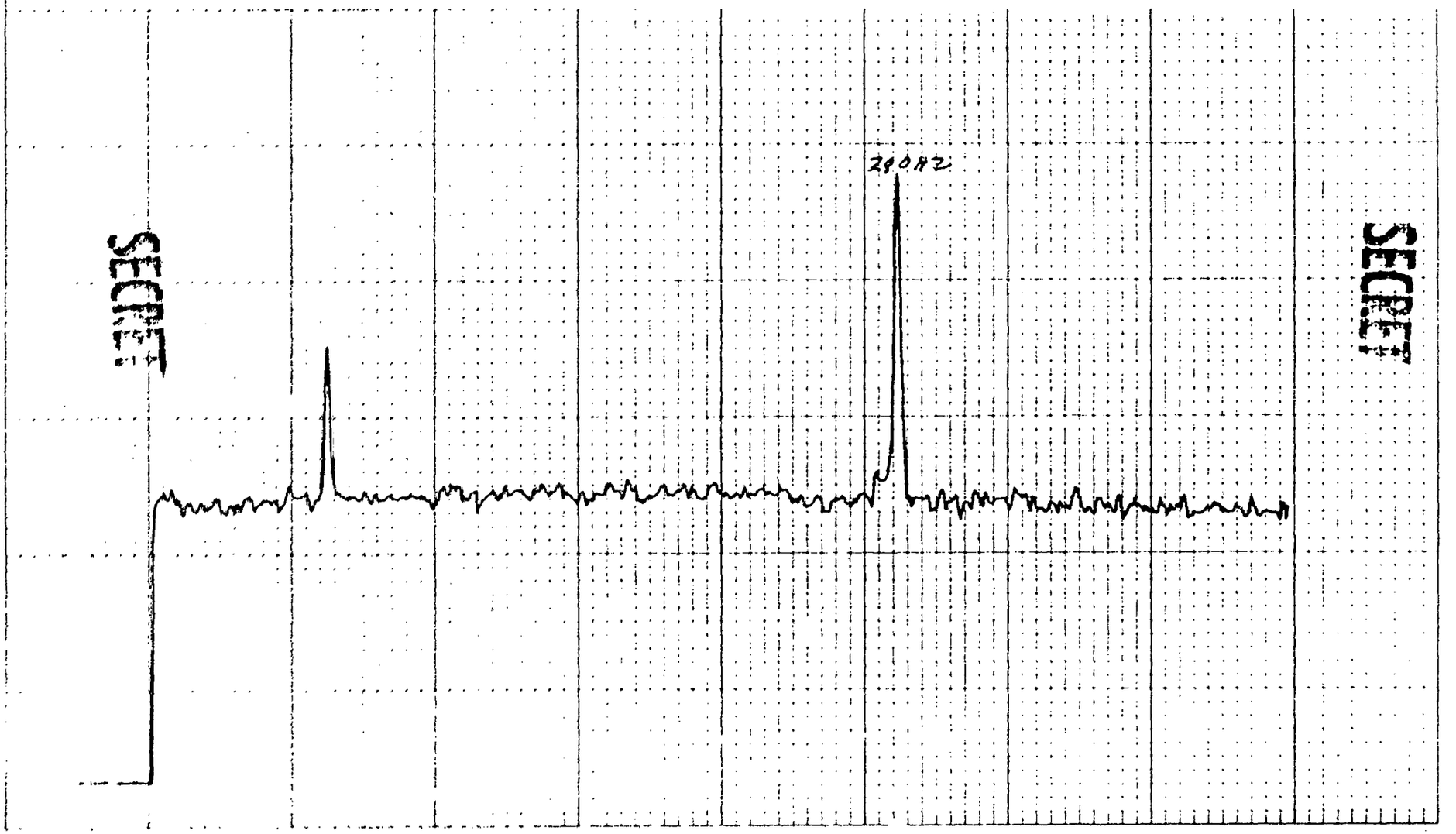
CONTROL: 2-8 -0202 (22)
OMNI SPECTRUM (ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-72 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F28 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



CONTROL: 2-8 -0202 (23)
OMNI SPECTRUM(ELEMENT 47)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

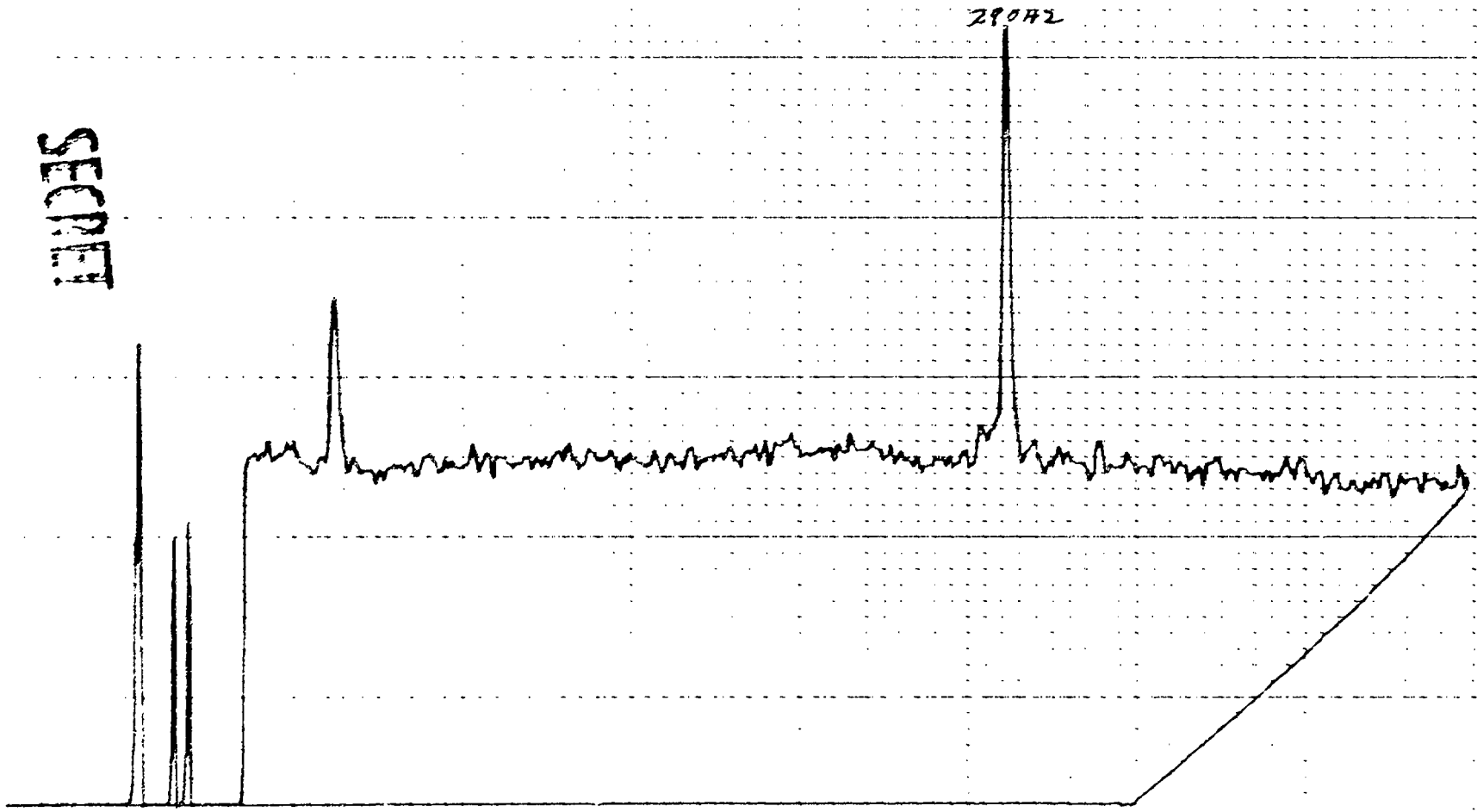
DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

INTEGRATION TIME 320 SECS
FILTER

REEL: F29 INDEX 1145

ATTEN: — DB
WTG: HANNING



SECRET

SECRET

46 0703

CONTROL: 2-8 -0202 (24)
OMNI SPECTRUM (ELEMENT 49)
EXERCISE: BEARING STAKE
CENTER FREQ: 290 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29

INDEX 1145

INTEGRATION TIME 320 SECS
FILTER

ATTEN: — DB
WTG: HANNING

SECRET

SECRET

45 0703

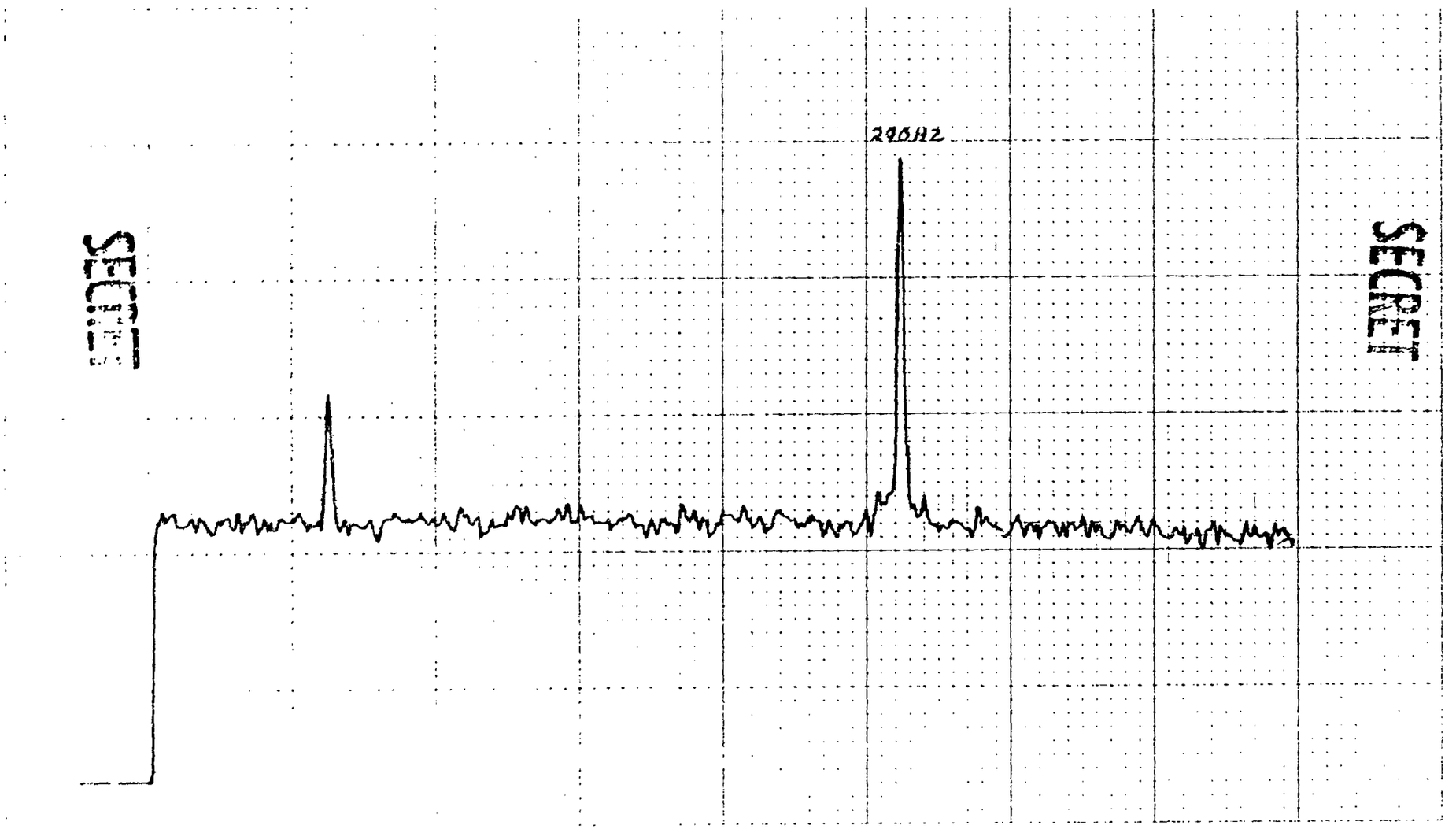
CONTROL: 2-8 -0202 (25)
OMNI SPECTRUM(ELEMENT 51)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

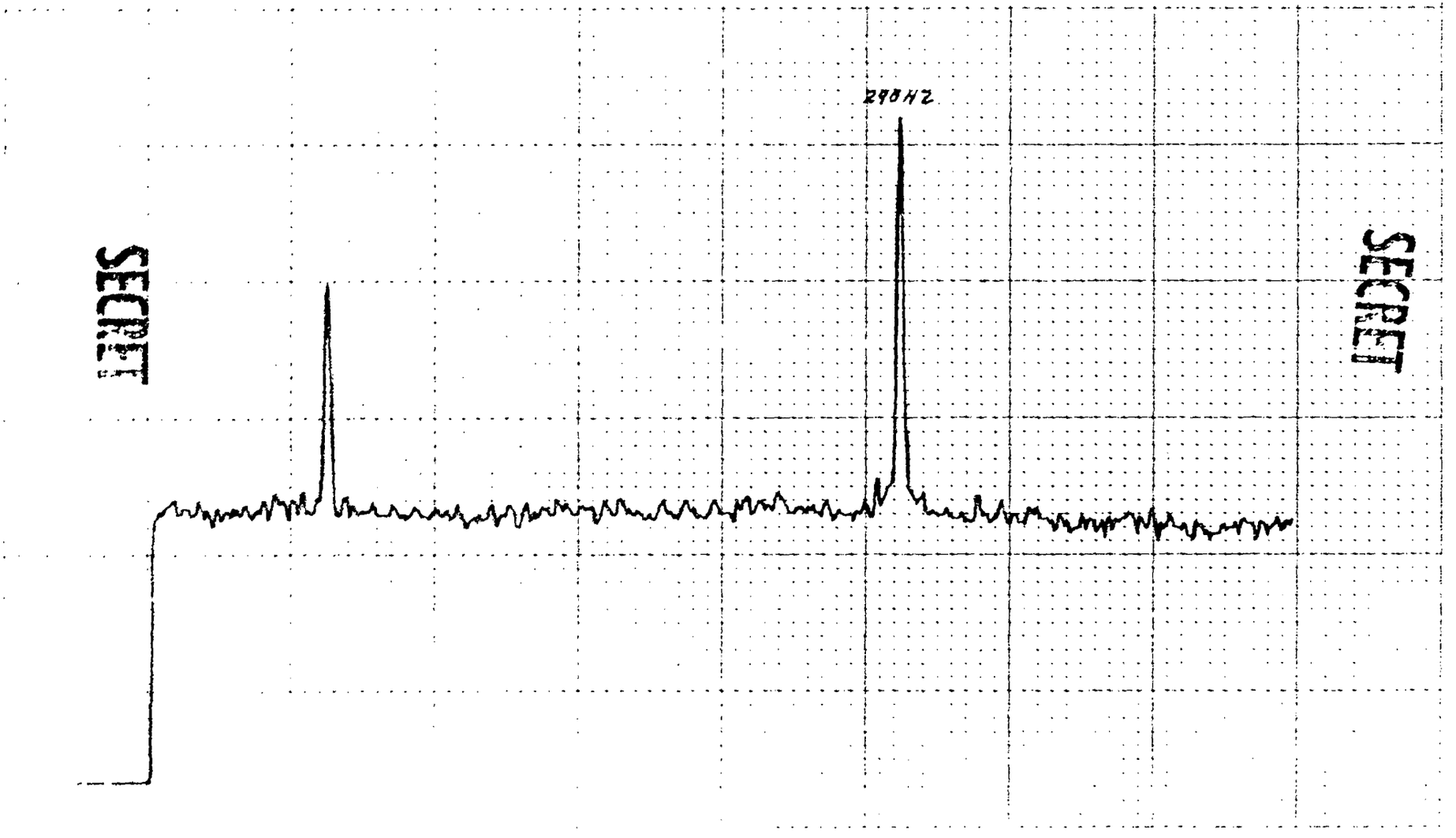
CONTROL: 2-8 -0202 (26)
OMNI SPECTRUM(ELEMENT 53)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

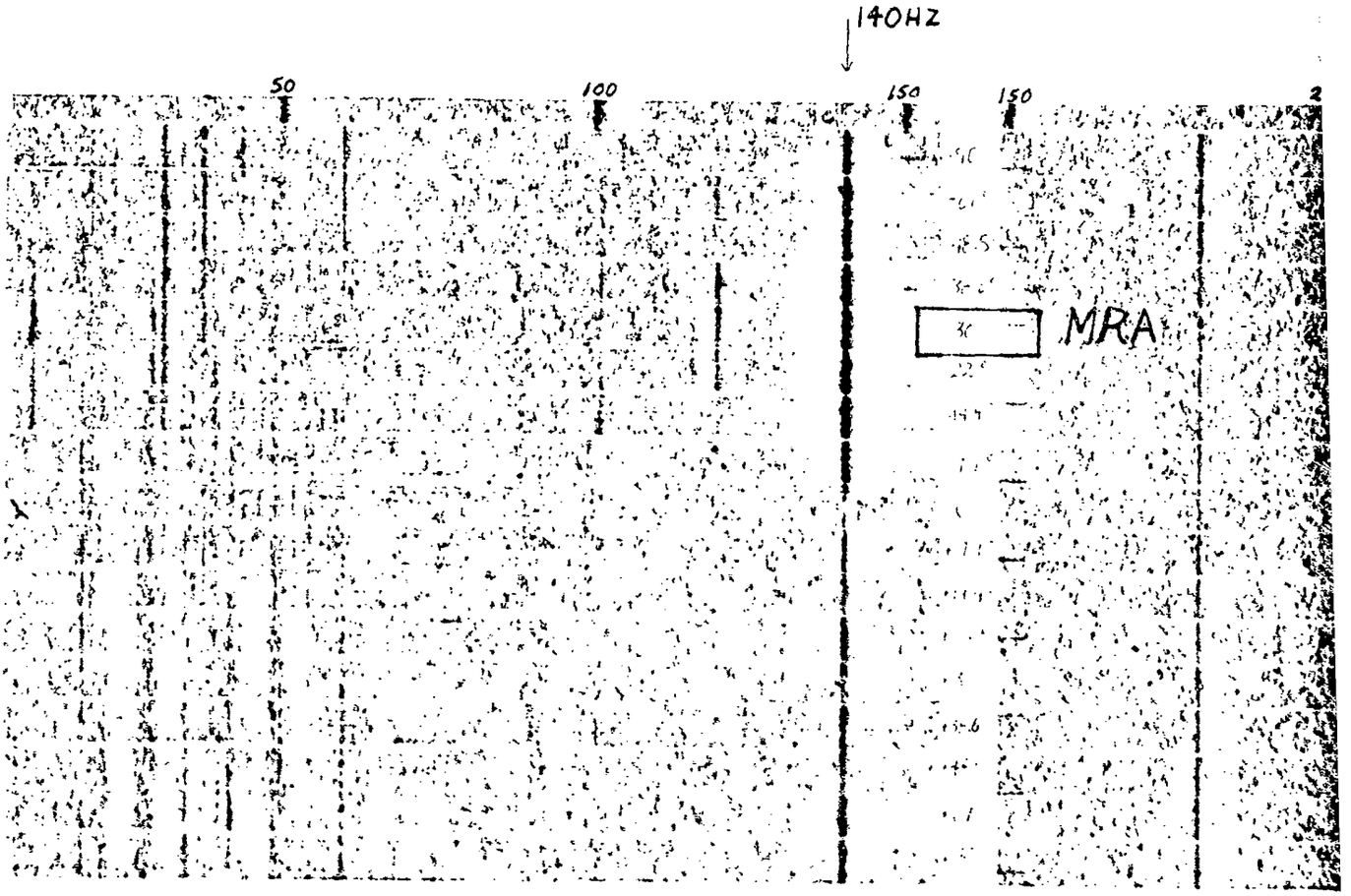
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECTION 3



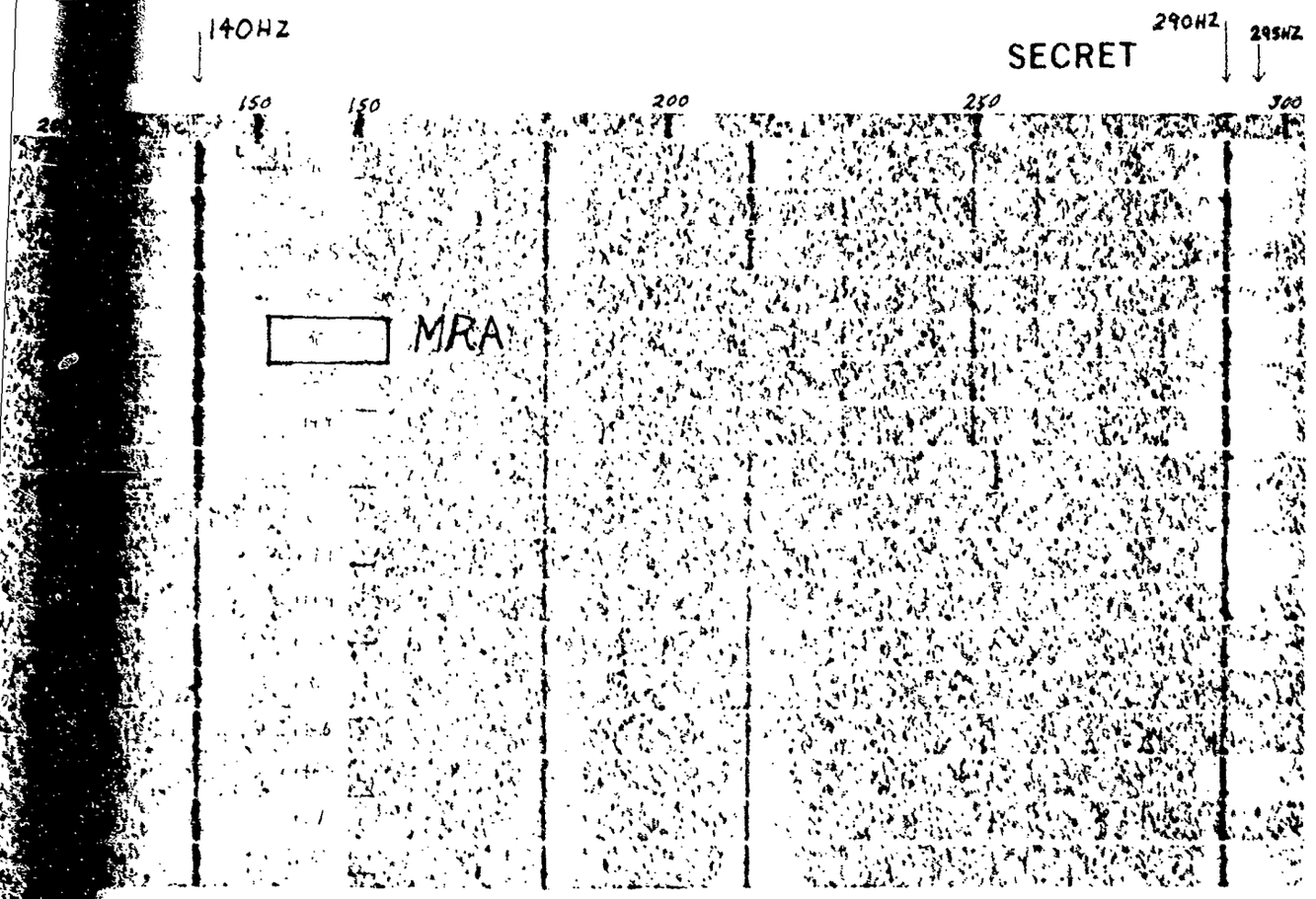
H I S T O F R A Z

CONTROL NUMBER _____ TAPE REEL NUMBER _____

NUMBER OF ELEMENTS _____ ELEME

FREQUENCY BAND _____ TO _____ HZ ANALYSIS BAND WIDTH _____ HZ DATE_

RANGE _____ N.M. WATER DEPTH _____ FM. EXERC



SECRET

HISTOFRAZ

TAPE REEL NUMBER _____

ANALYSIS BAND WIDTH _____ HZ

WATER DEPTH _____ FMS

TAPE COUNT _____

ELEMENT NUMBERS _____

DATE _____

EXERCISE: BEARING STAKE

SAN-XXX-78-0135

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 7 FREQUENCY 140 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-22.8	
MCPS-32 CAL. CORRECTION	+10	-12.8	
BEAMFORMER GAIN	+24	+11.2	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .2	+11.4	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-65.4	
MCPS-32 CAL. CORRECTION	+10	-55.4	
BEAMFORMER GAIN	+24	-31.4	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+11.2	
SIGNAL LEVEL FOR SNR	-31.4	42.6	
PROCESSOR CORRECTION	-4.0	38.6	
MRA CORRECTION	+ .2	38.8	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	30.6	SNR 1 HZ BAND

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 7 FREQUENCY 296 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-26.6	
MCPS-32 CAL. CORRECTION	+10	-16.6	
BEAMFORMER GAIN	+24	+7.4	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	+8.2	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-71.8	
MCPS-32 CAL. CORRECTION	+10	-61.8	
BEAMFORMER GAIN	+24	-37.8	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+8.2	
SIGNAL LEVEL FOR SNR	-37.8	45	
PROCESSOR CORRECTION	-4.0	41	
MRA CORRECTION	+ .8	41.8	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	33.6	SNR 1 HZ BAND

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 7 FREQUENCY 295 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-62.4	
MCPS-32 CAL. CORRECTION	+10	-52.4	
BEAMFORMER GAIN	+24	-28.4	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	-27.6	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-71.8	
MCPS-32 CAL. CORRECTION	+10	-61.8	
BEAMFORMER GAIN	+24	-37.8	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-27.6	
SIGNAL LEVEL FOR SNR	-37.8	10.2	
PROCESSOR CORRECTION	-5.6	4.6	
MRA CORRECTION	+ .8	5.4	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	-2.8	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 7

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-16.0	-17.5	
MRA SIGNAL LEVEL	+11.4	+ 8.2	- 27.6
ARRAY SIGNAL GAIN	27.4	25.7	
20 LOG 16 (# of elements)	24	24	
DIFFERENCE	+3.4	+1.7	

ARRAY GAIN

MRA SNR	38.8	41.8	5.4
MEAN OMNI SNR	29.4	35.4	
ARRAY GAIN	9.4	6.4	
THEORETICAL AZMUTH GAIN (at MRA)	10.0	12.0	11.7
DIFFERENCE	- .6	-5.6	

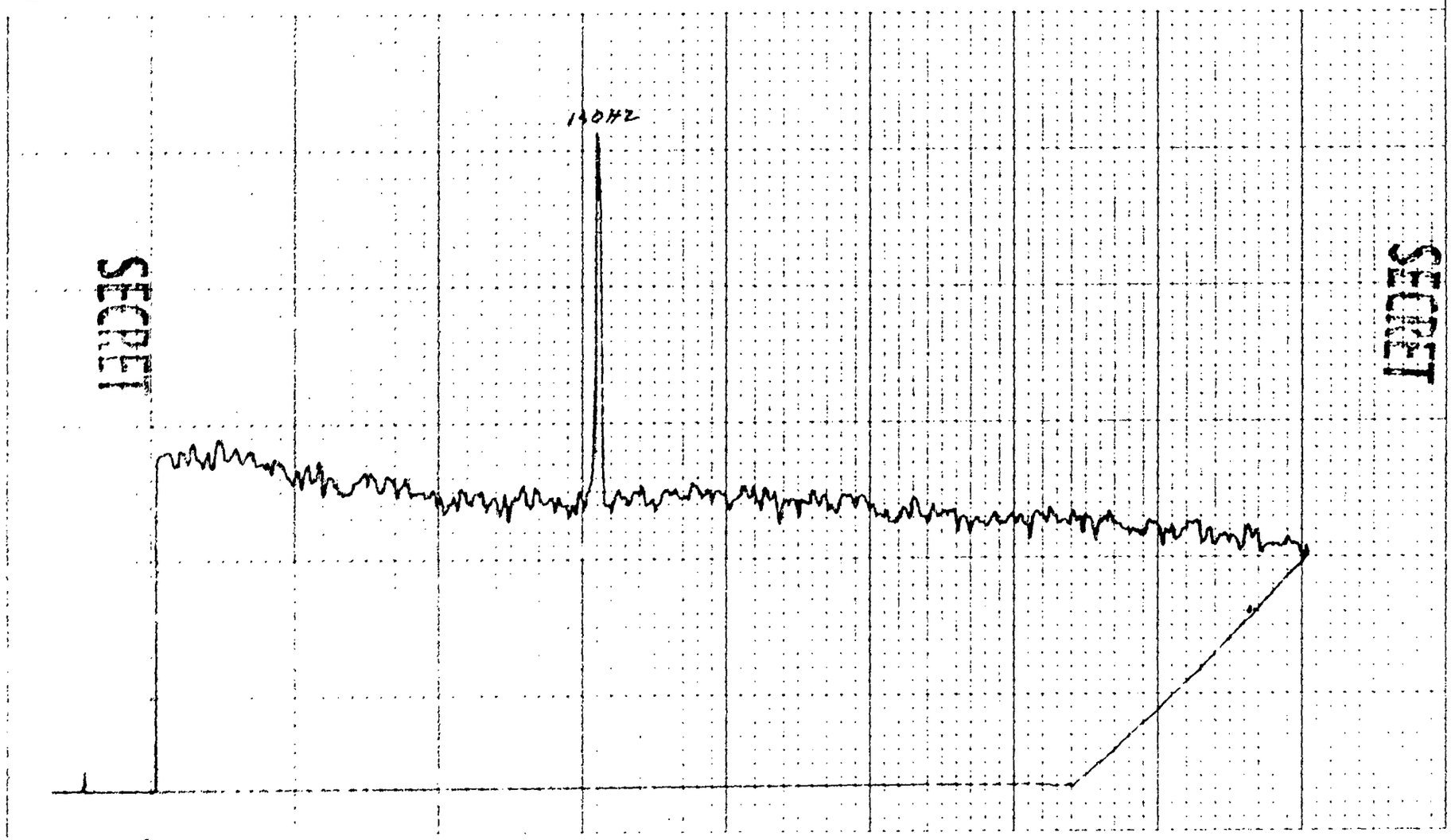
46 0703

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-12 DEG. AZ STEERING

REEL: F29
INDEX 1145

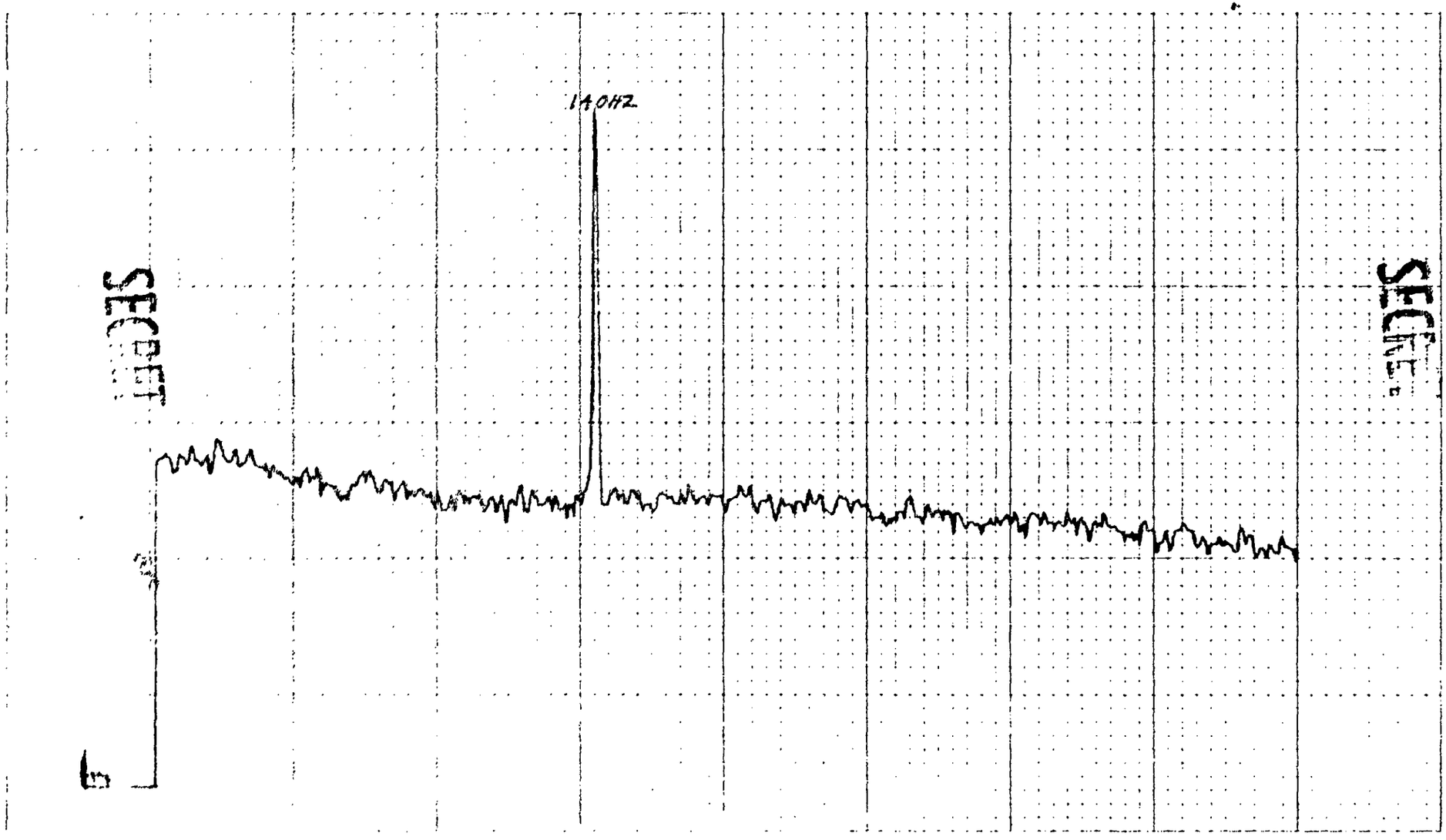
INTEGRATION TIME 320 SECS
FILTER
ATTEN: -24 DB
WTG: HANNING



CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-14 DEG. AZ STEERING

REEL: F29
INDEX 1145
INTEGRATION TIME 320 SECS
ATTEN: -24 DB
FILTER WTG: HANNING

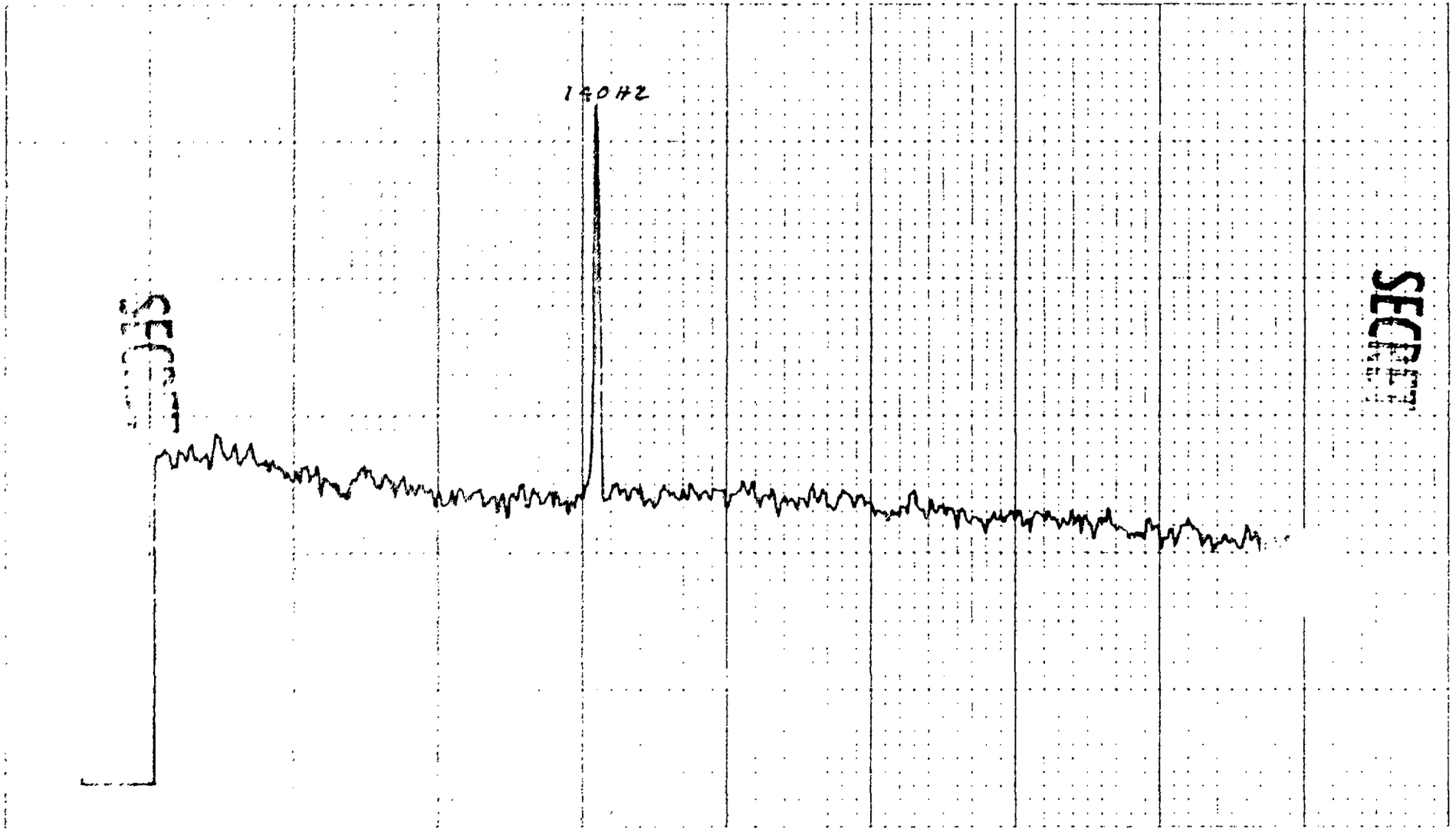


CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-16 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING



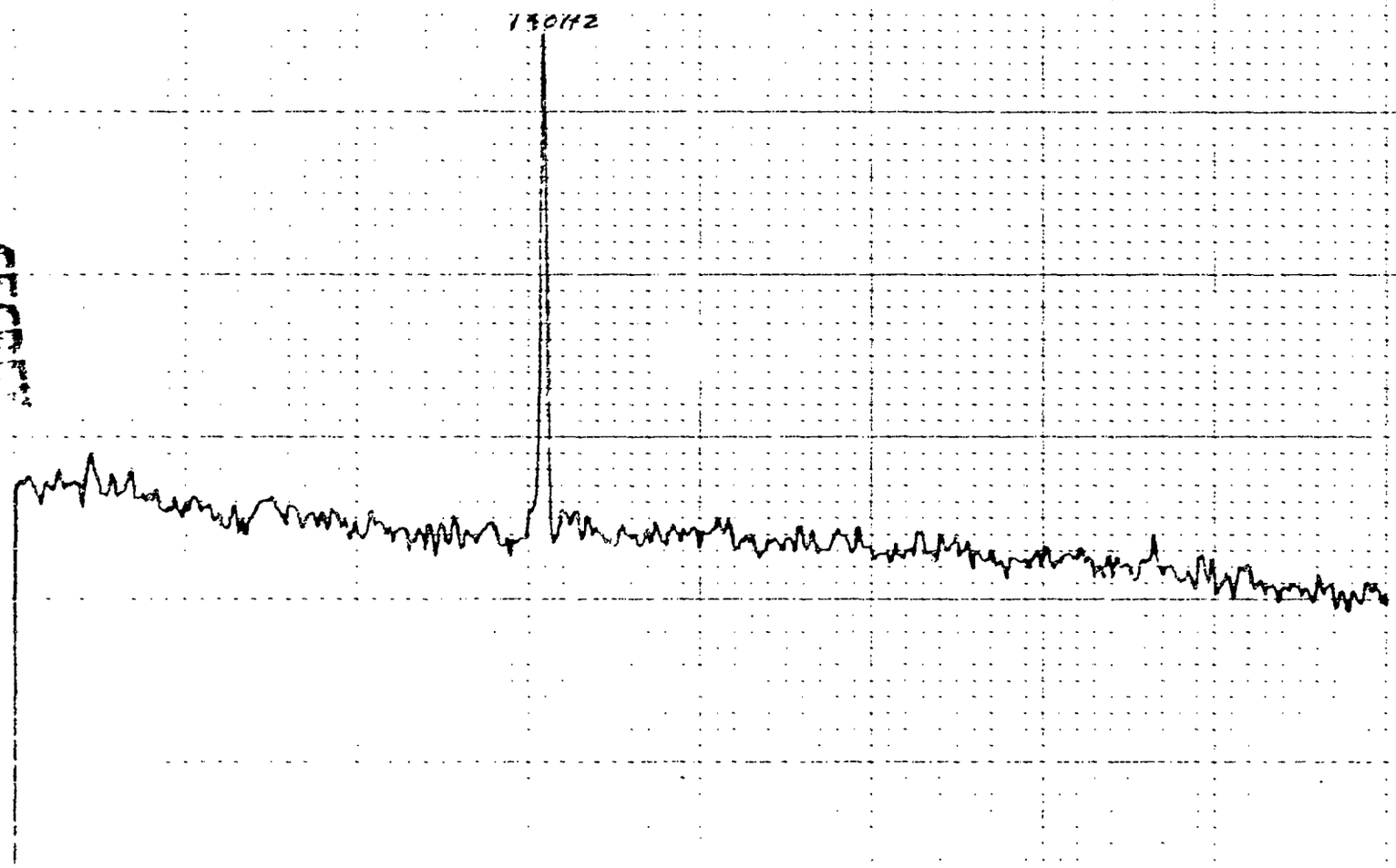
46 0703

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM (ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-19 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING



SECRET

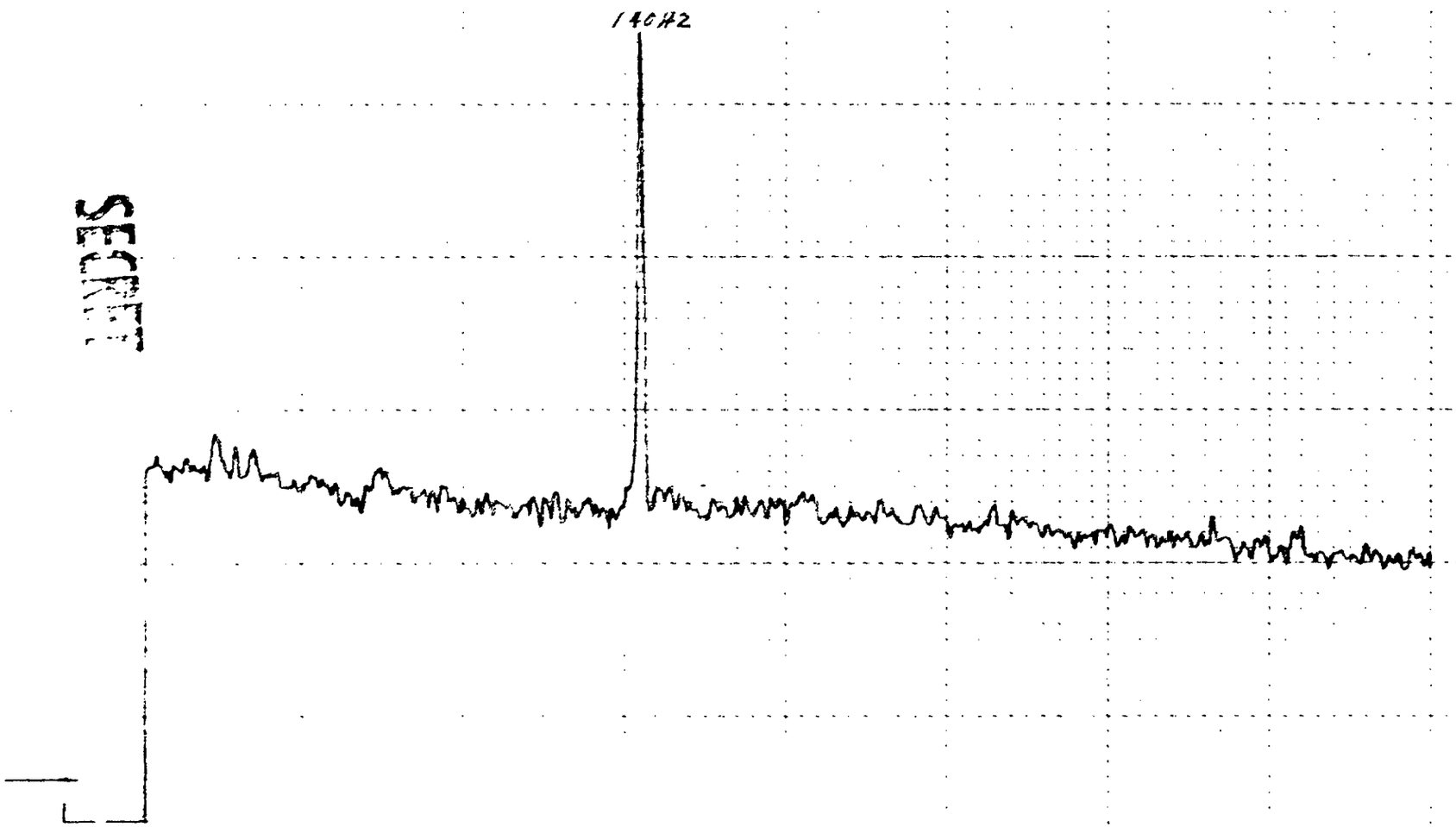
SECRET

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-16
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-19.5 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING



SECRET

SECRET

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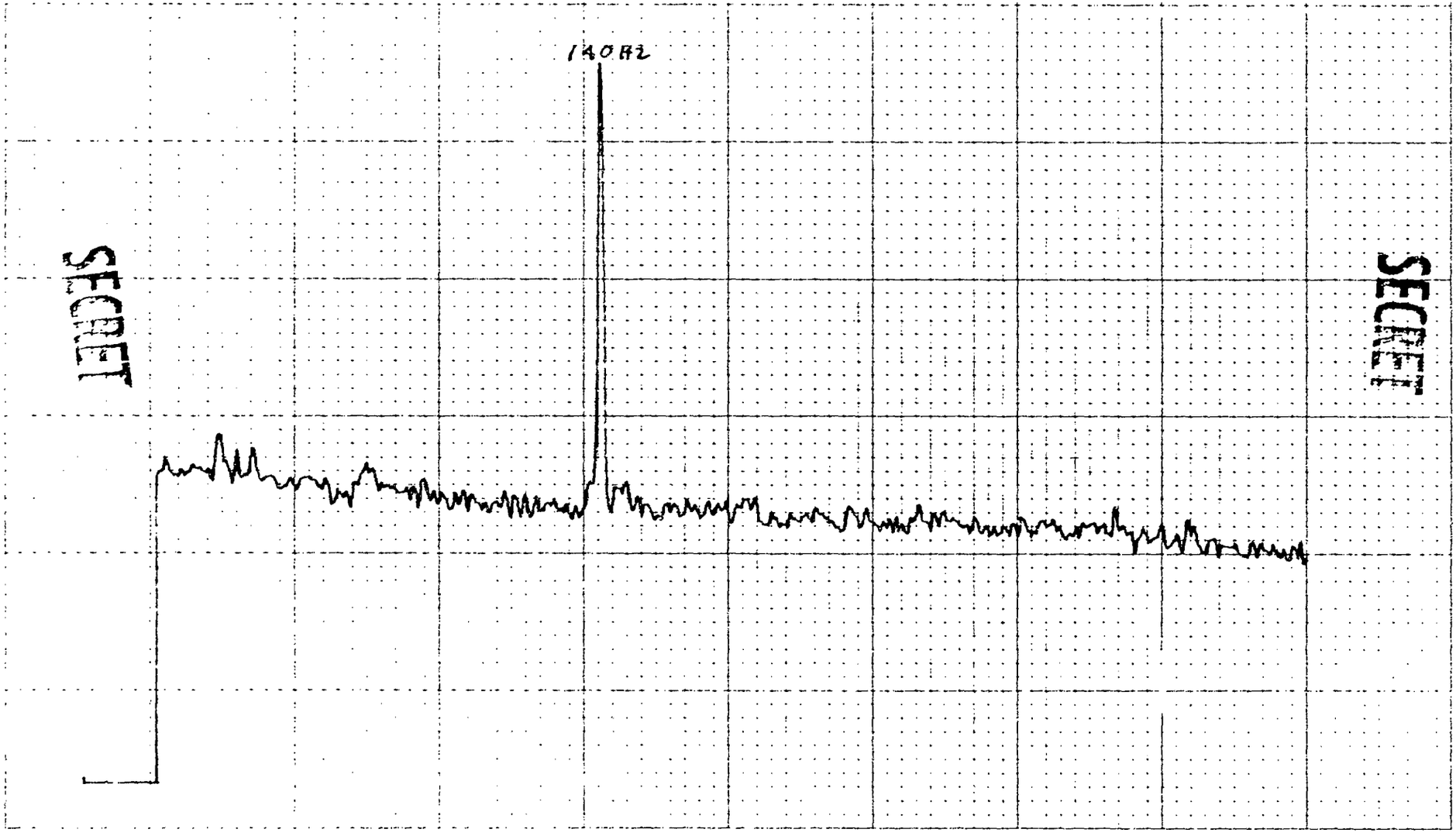
CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-22 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING

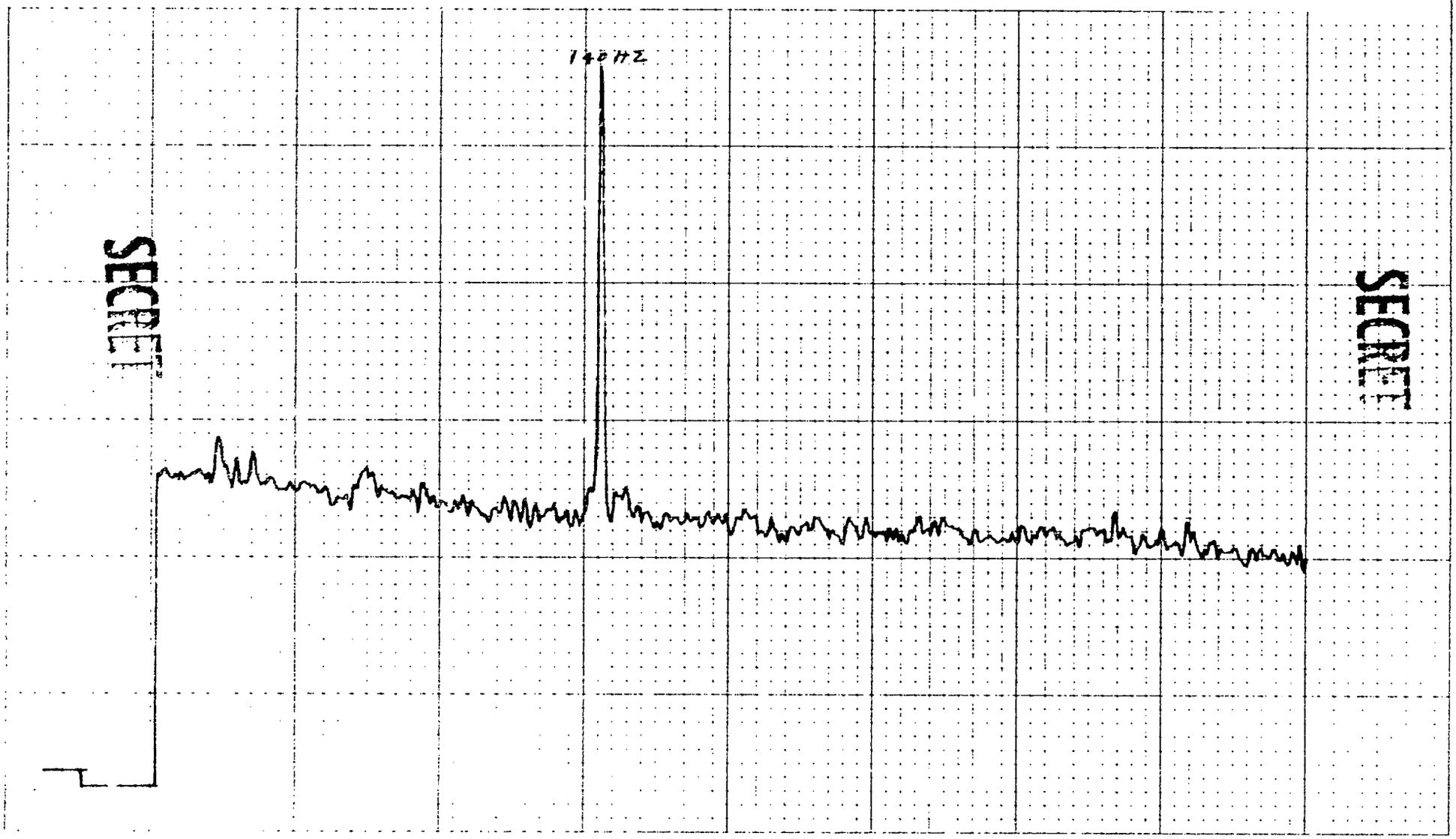


46 0703

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-24 DEG. AZ STEERING

REEL: F29
INDEX/145
INTEGRATION TIME 320 SECS
ATTEN: -24 DB
FILTER WTG: HANNING



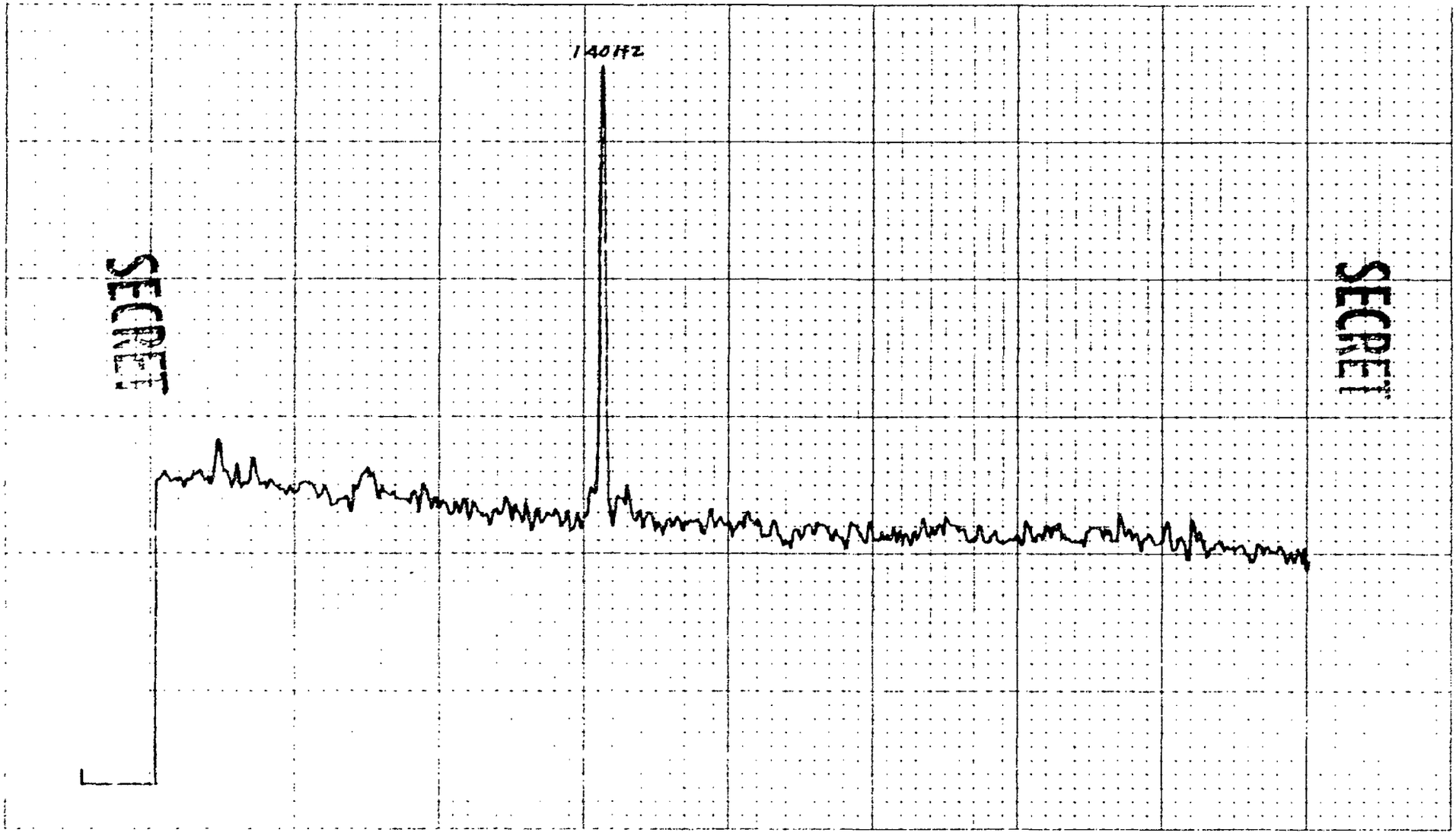
46 0703

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-26 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING

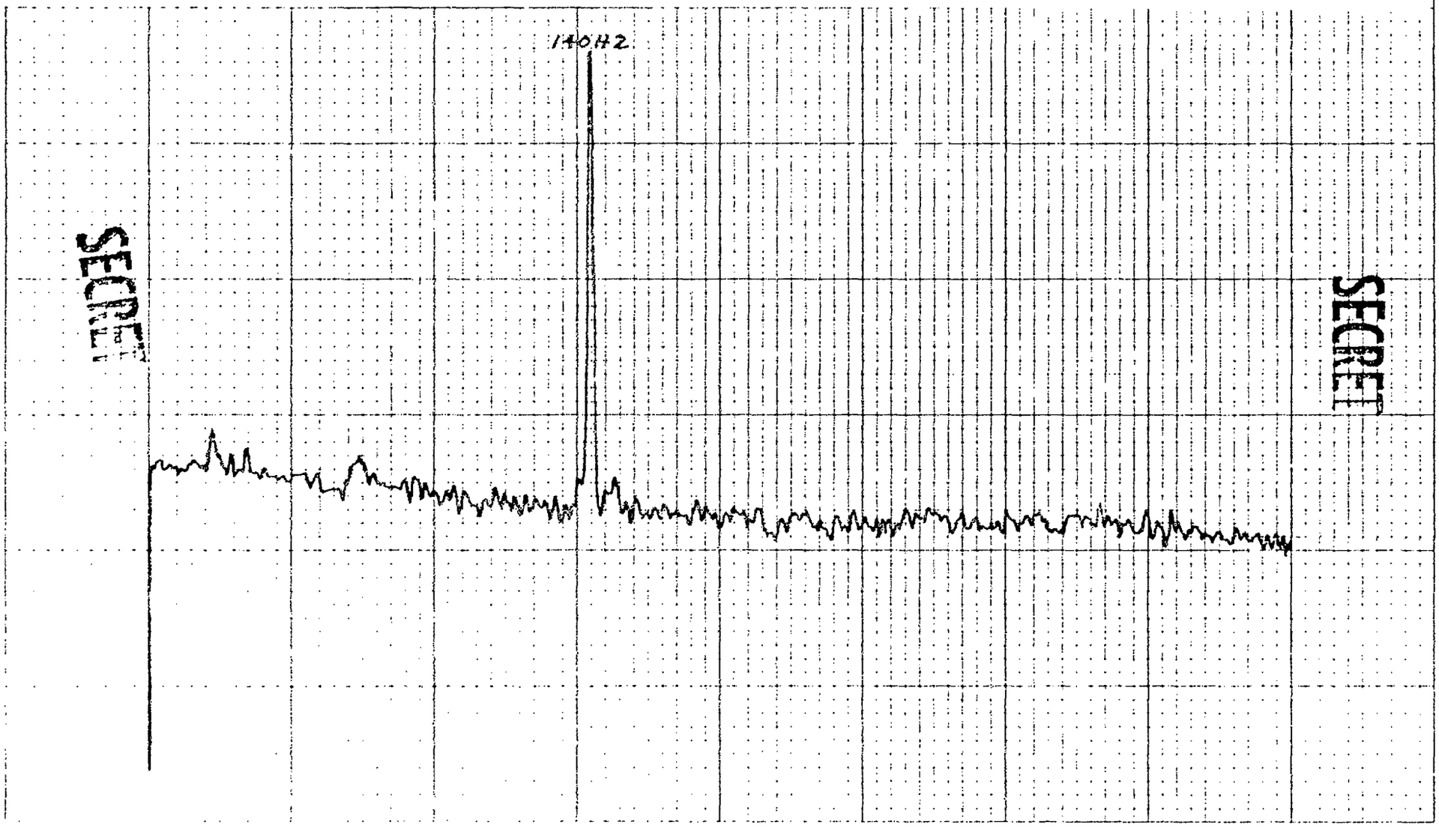


CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-27 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING

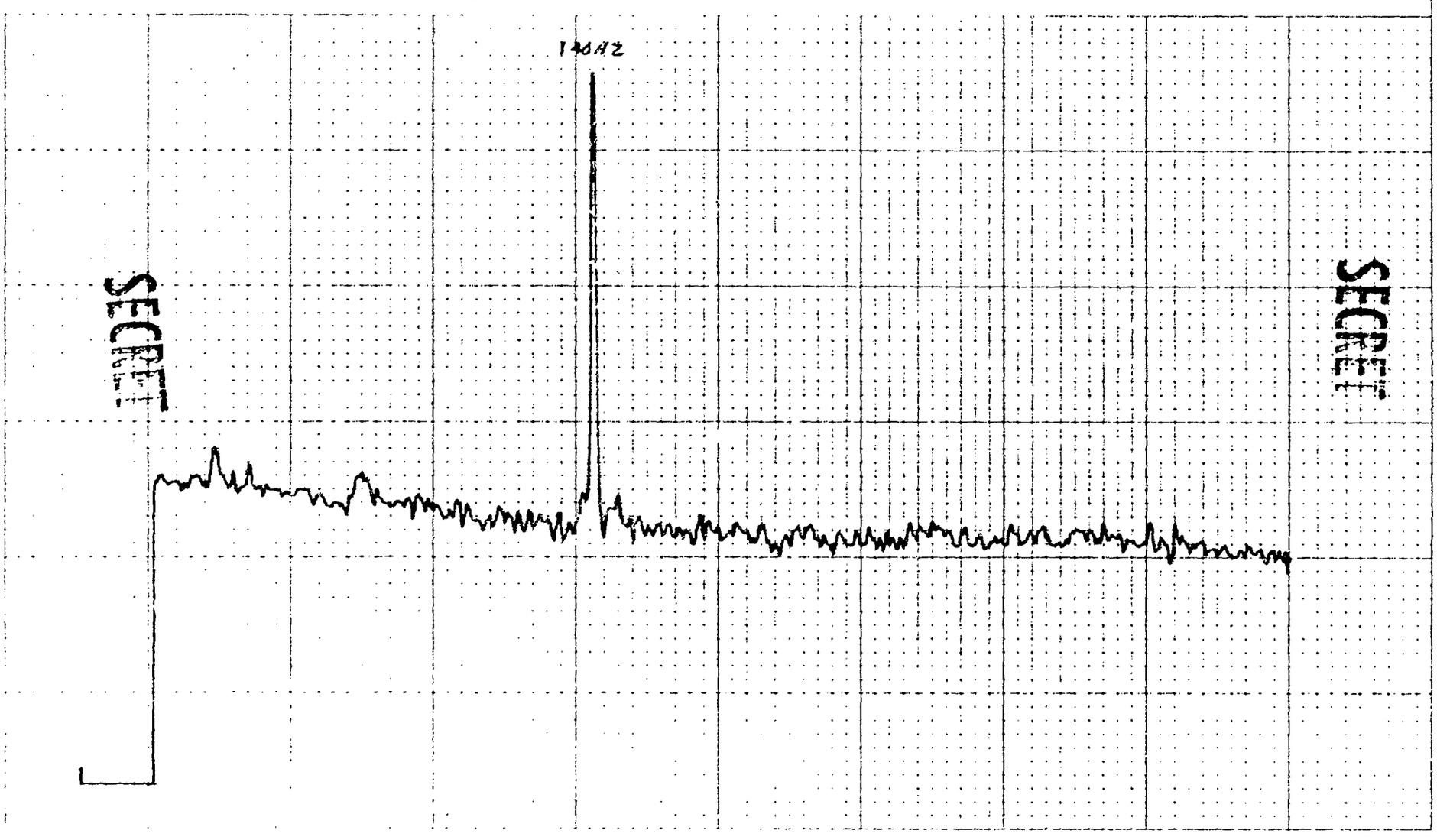


CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1 - 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-28 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: 24 DB



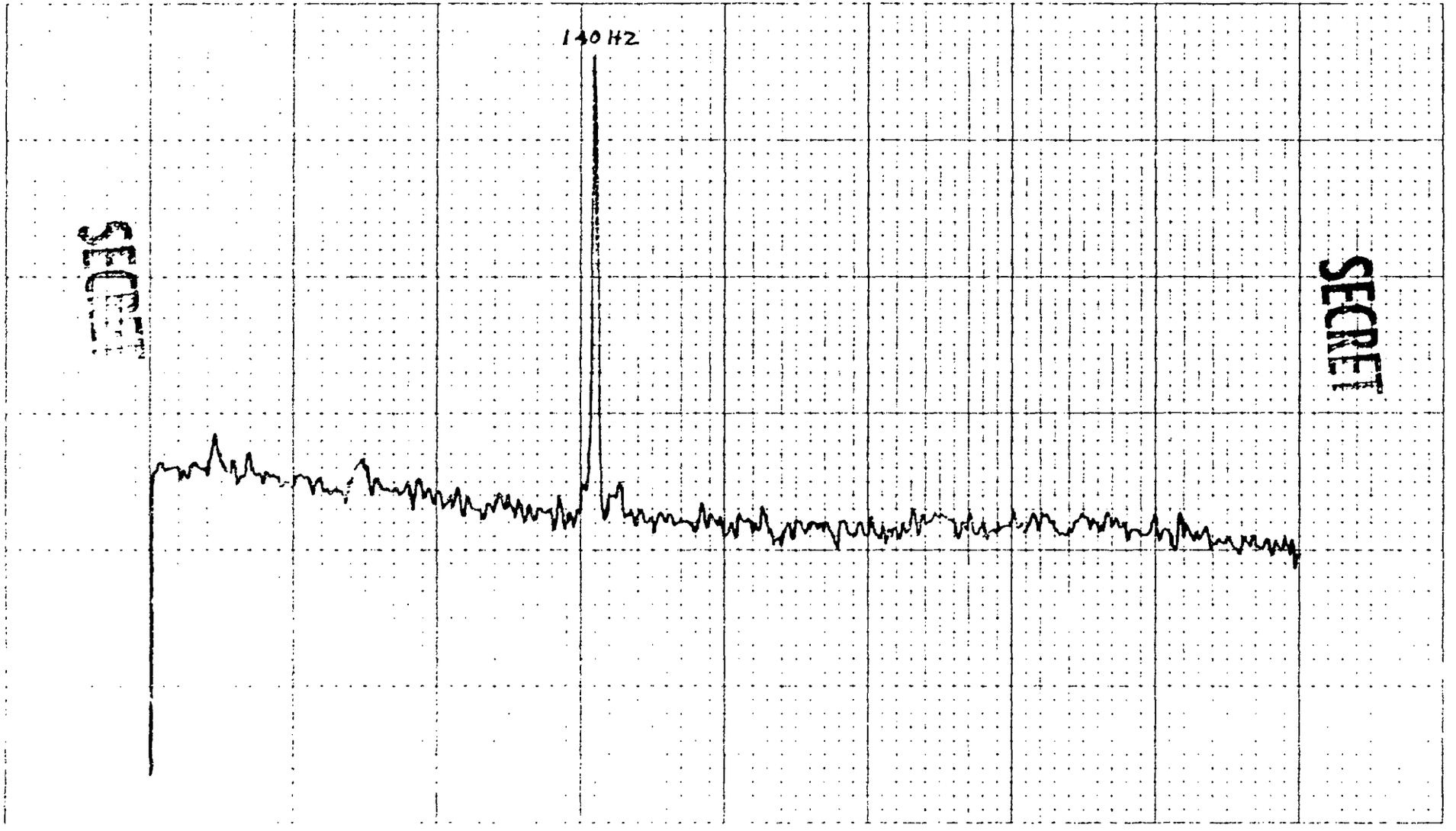
46 0703

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-29 DEG. AZ STEERING

REEL: F29
INDEX/145

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING
ATTEN: -24 DB



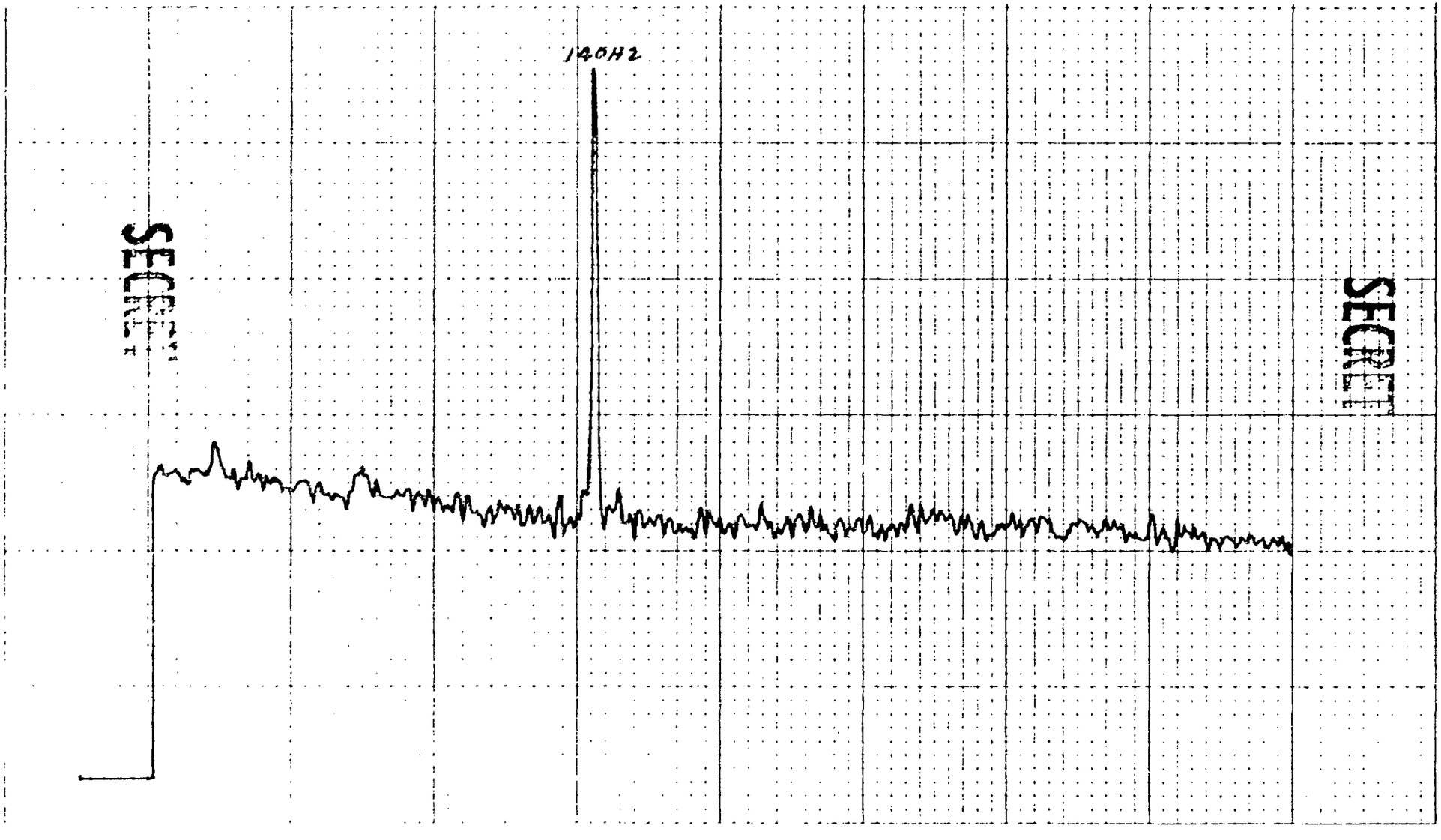
46 0703

CONTROL: 0202- 16 (DPT)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-30 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX/145
ATTEN: -24 DB
WTG: HANNING



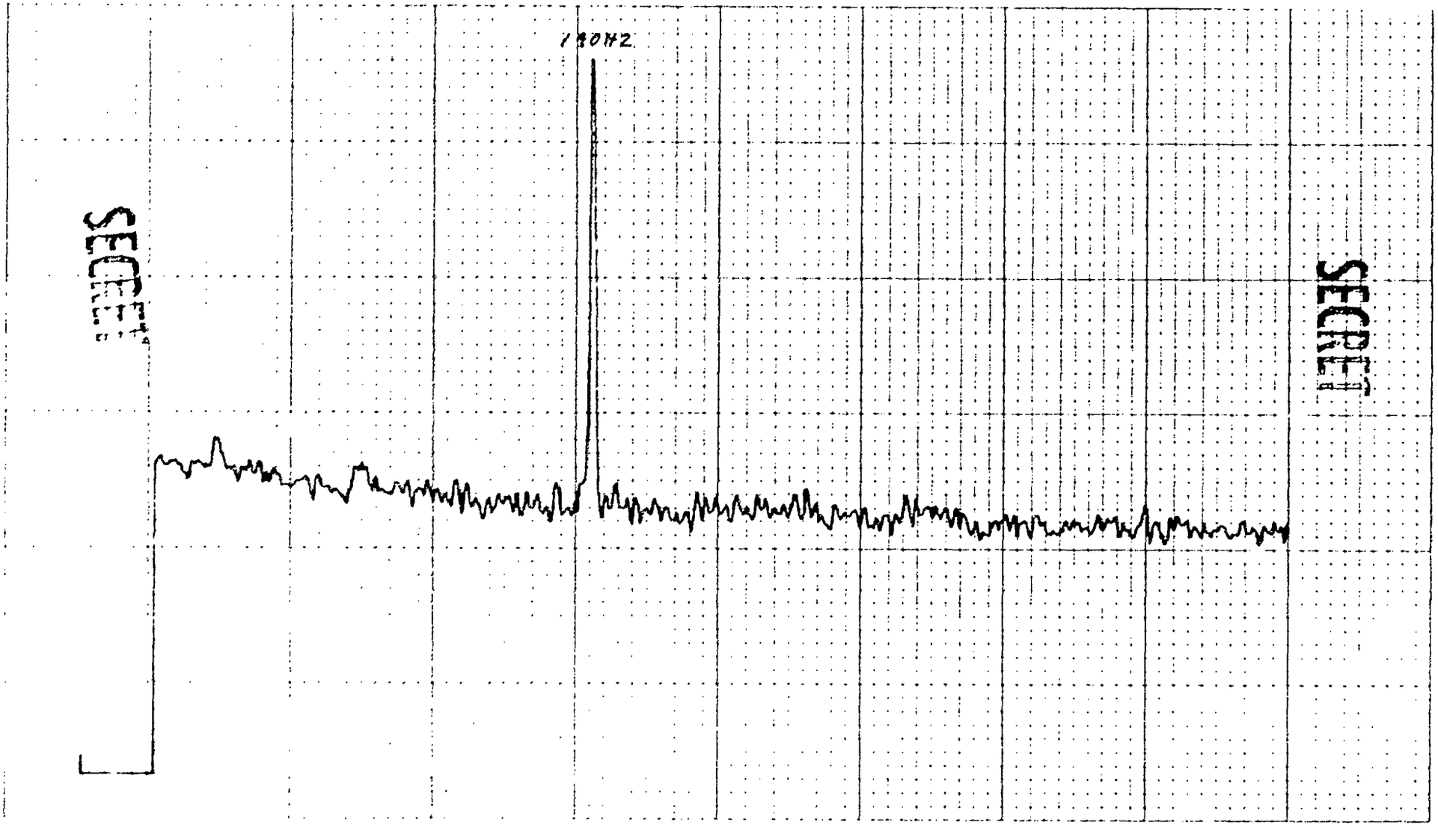
46 0703

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-32 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -24 DB



K+E

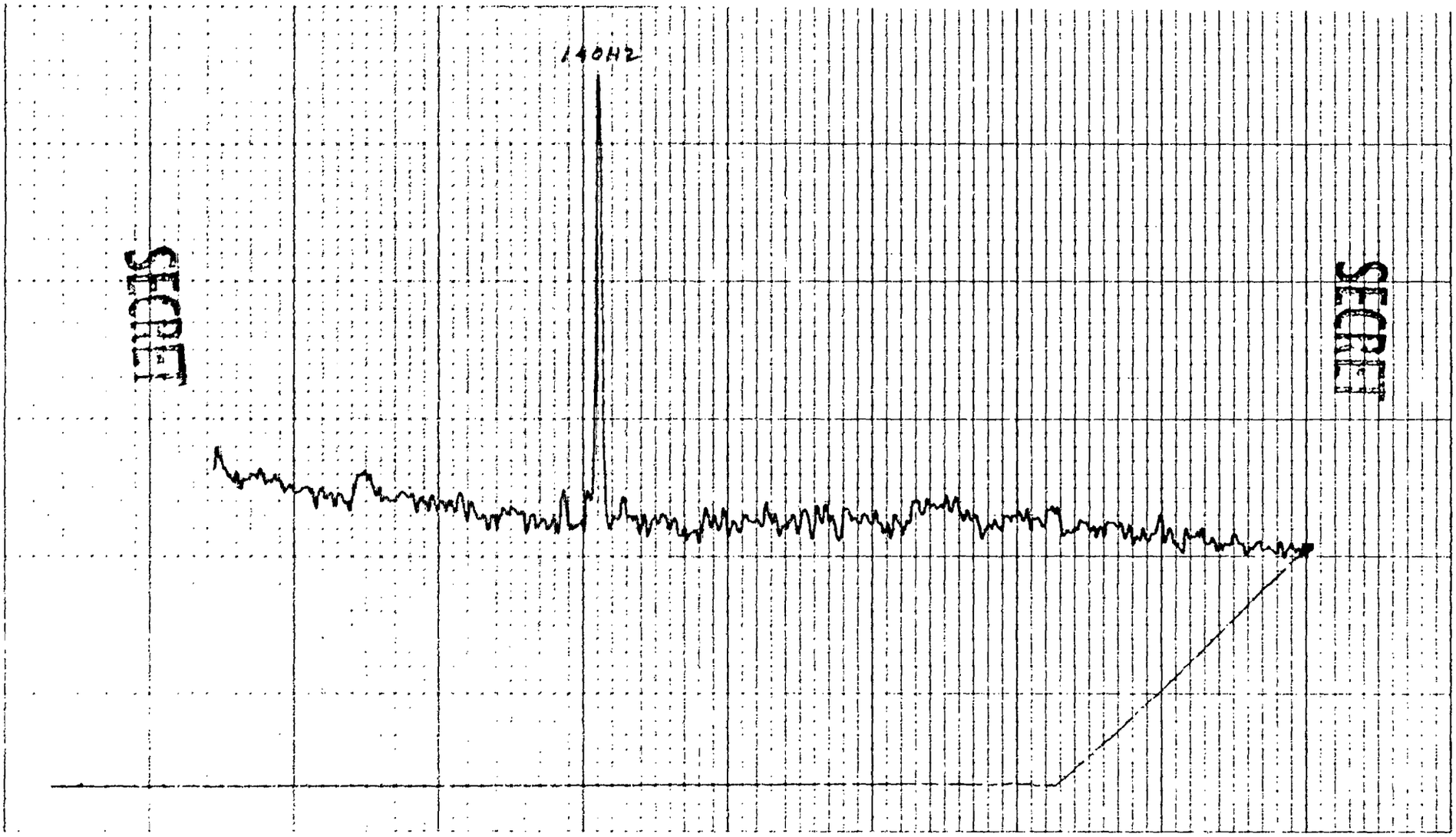
46 0703

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-74 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
ATTEN: -24 DB
FILTER WTG: HANNING



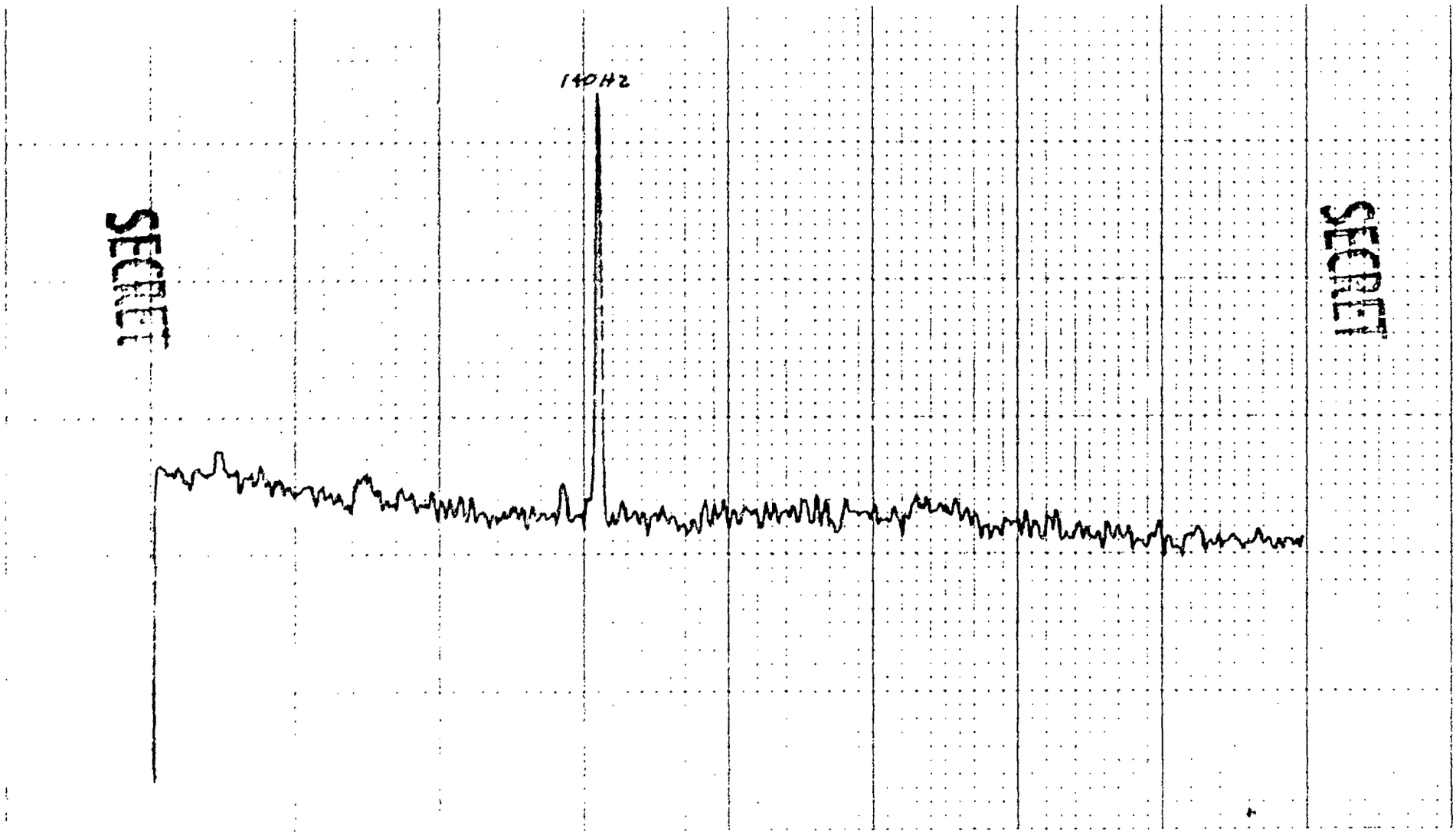
46 0703

CONTROL: 0202-16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-36 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING



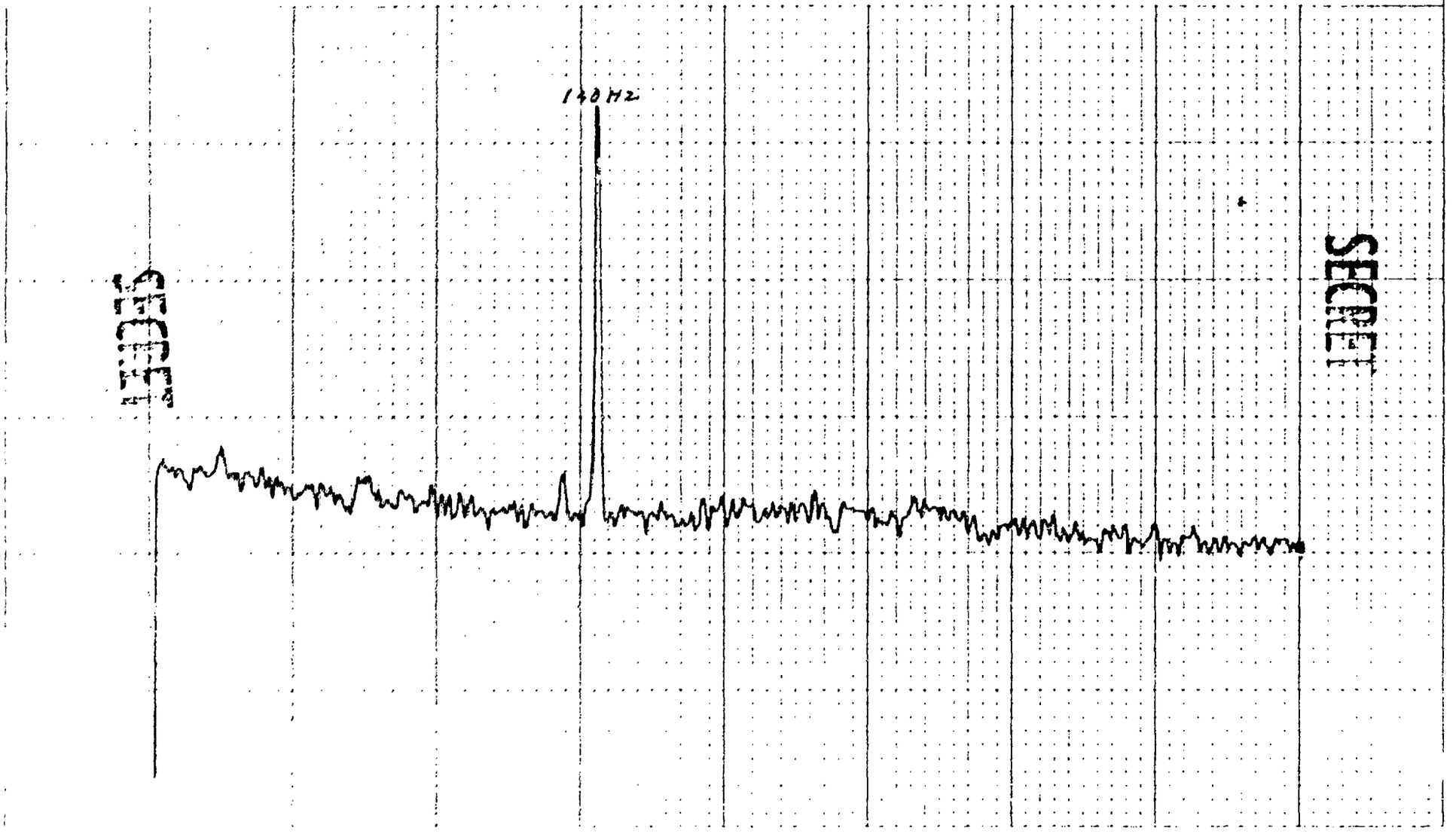
46 0703

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-30 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -24 DB



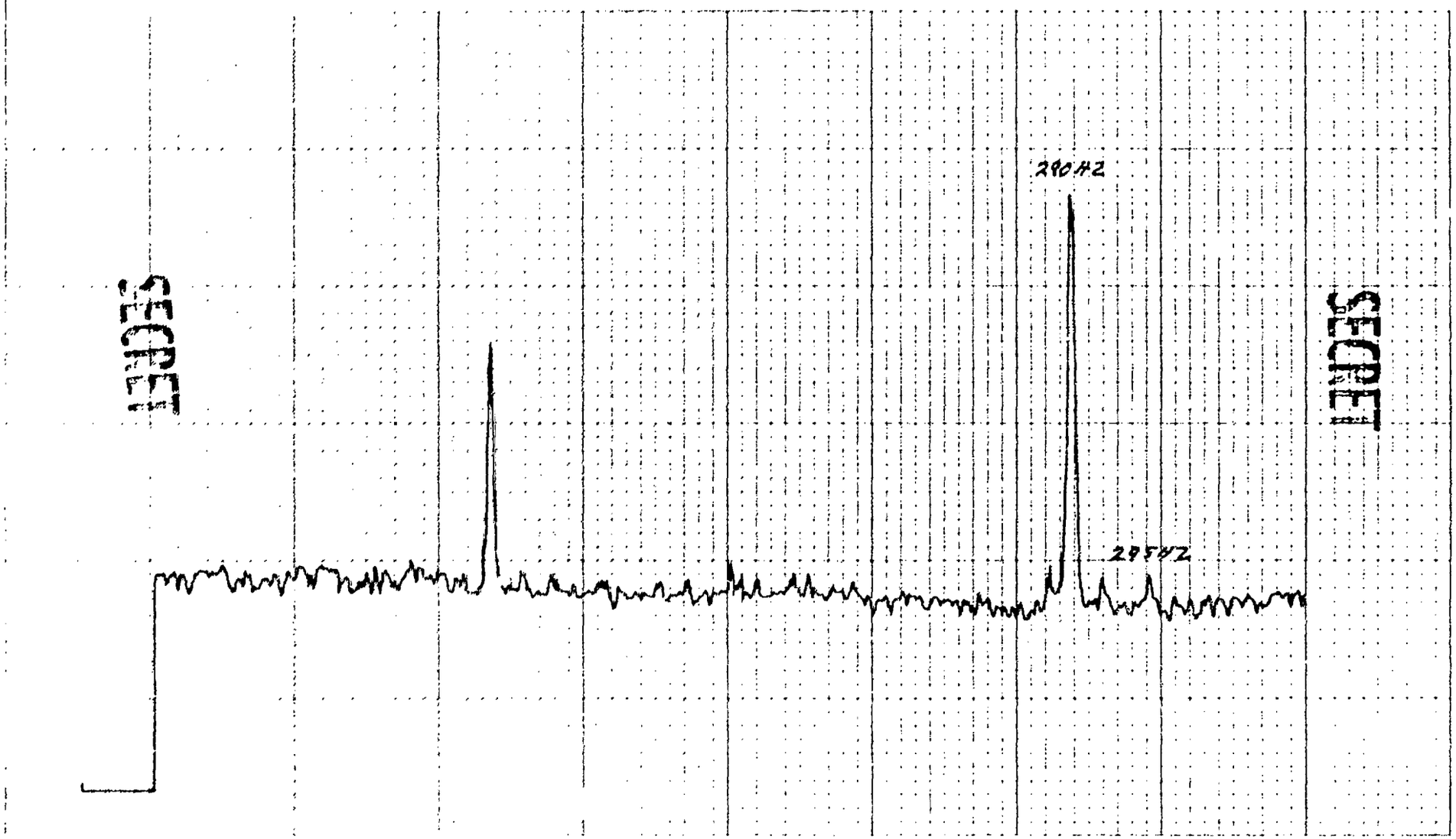
46 0703

CONTROL: 0202-16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-12 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -24 DB

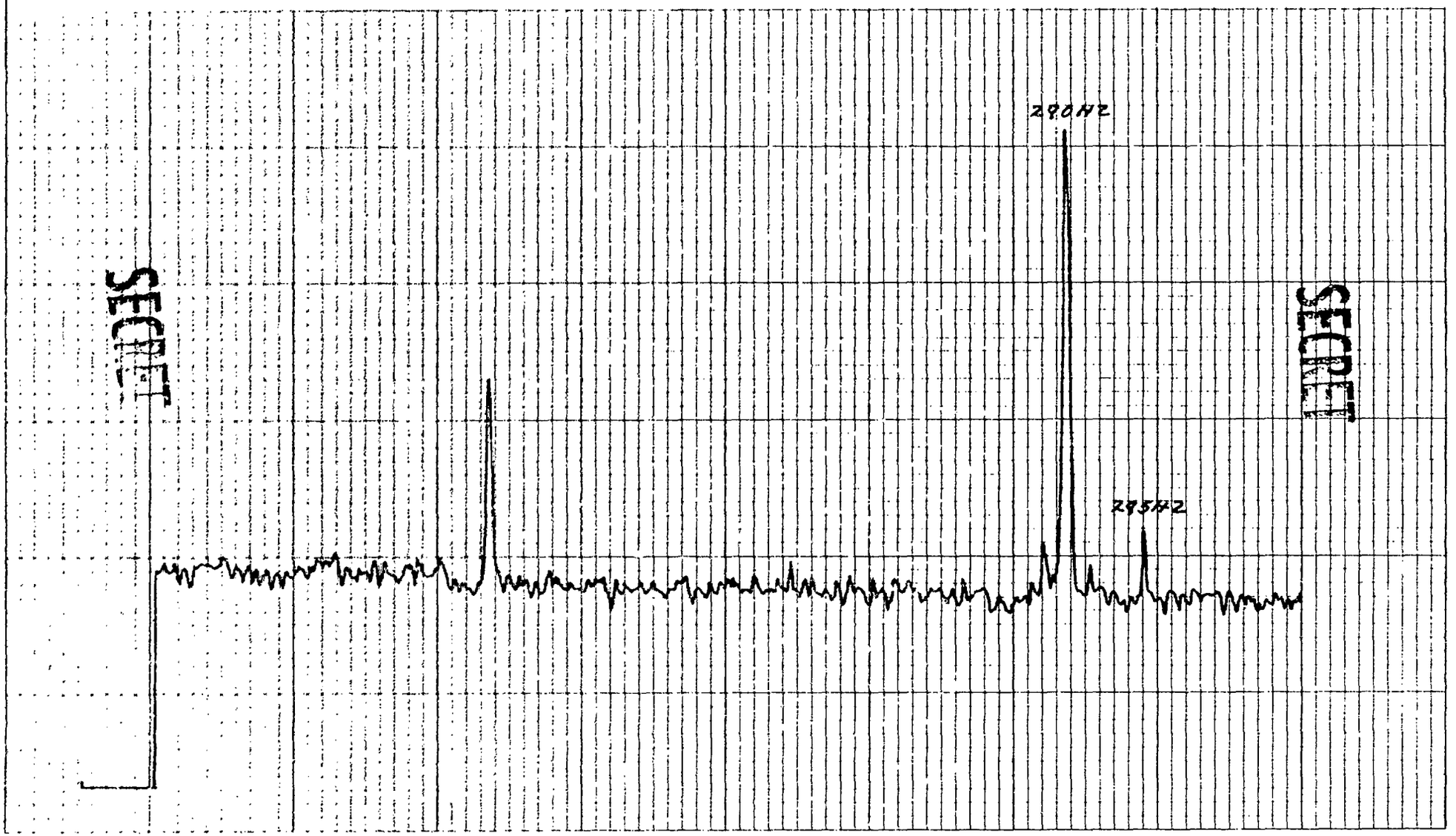


CONTROL: 0202-16 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-14 DEG. AZ STEERING

REEL: F09
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -24 DB



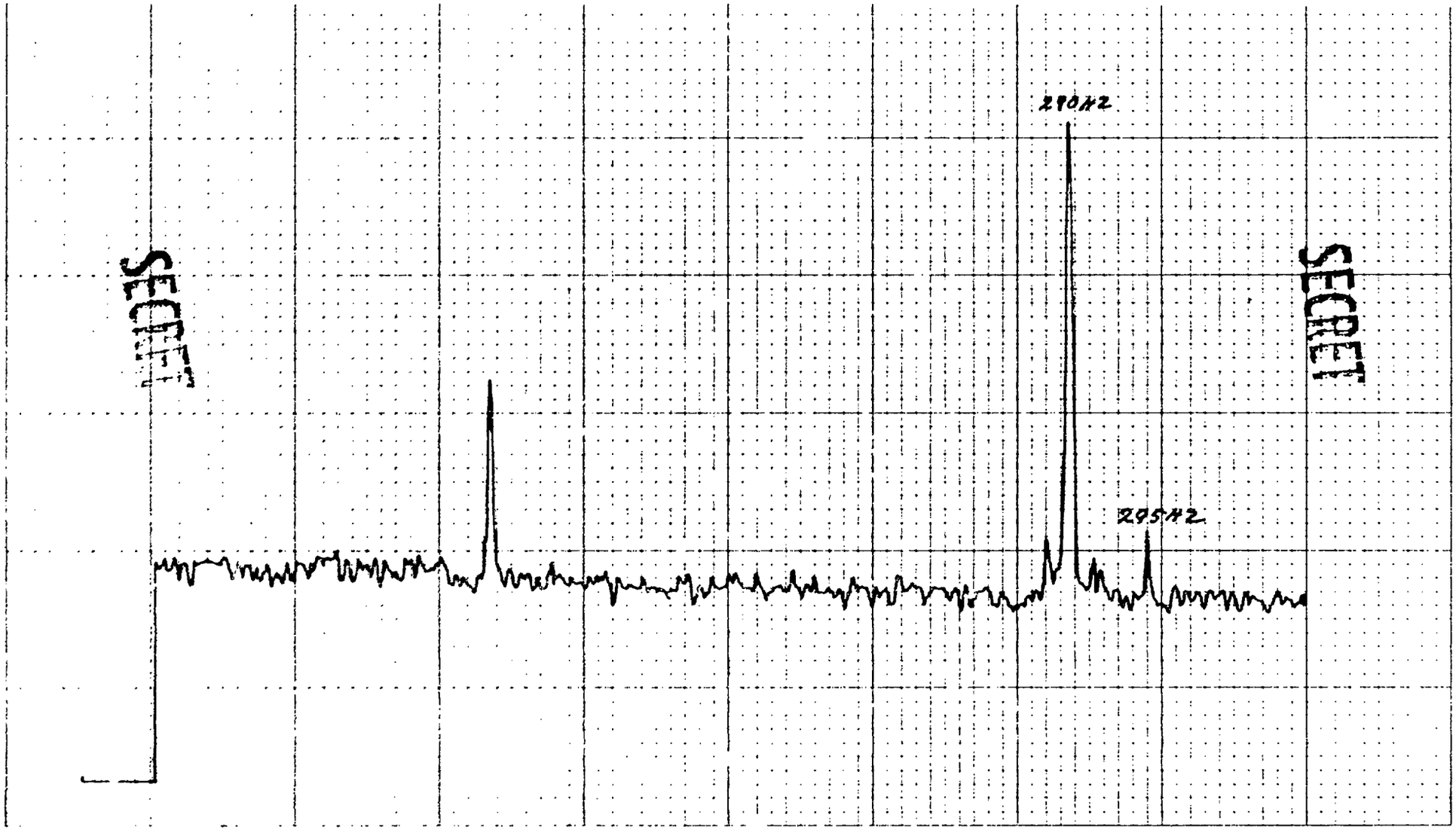
CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-16 DEG. AZ STEERING

REEL: F39
INDEX 1145

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

ATTEN: -24 DB

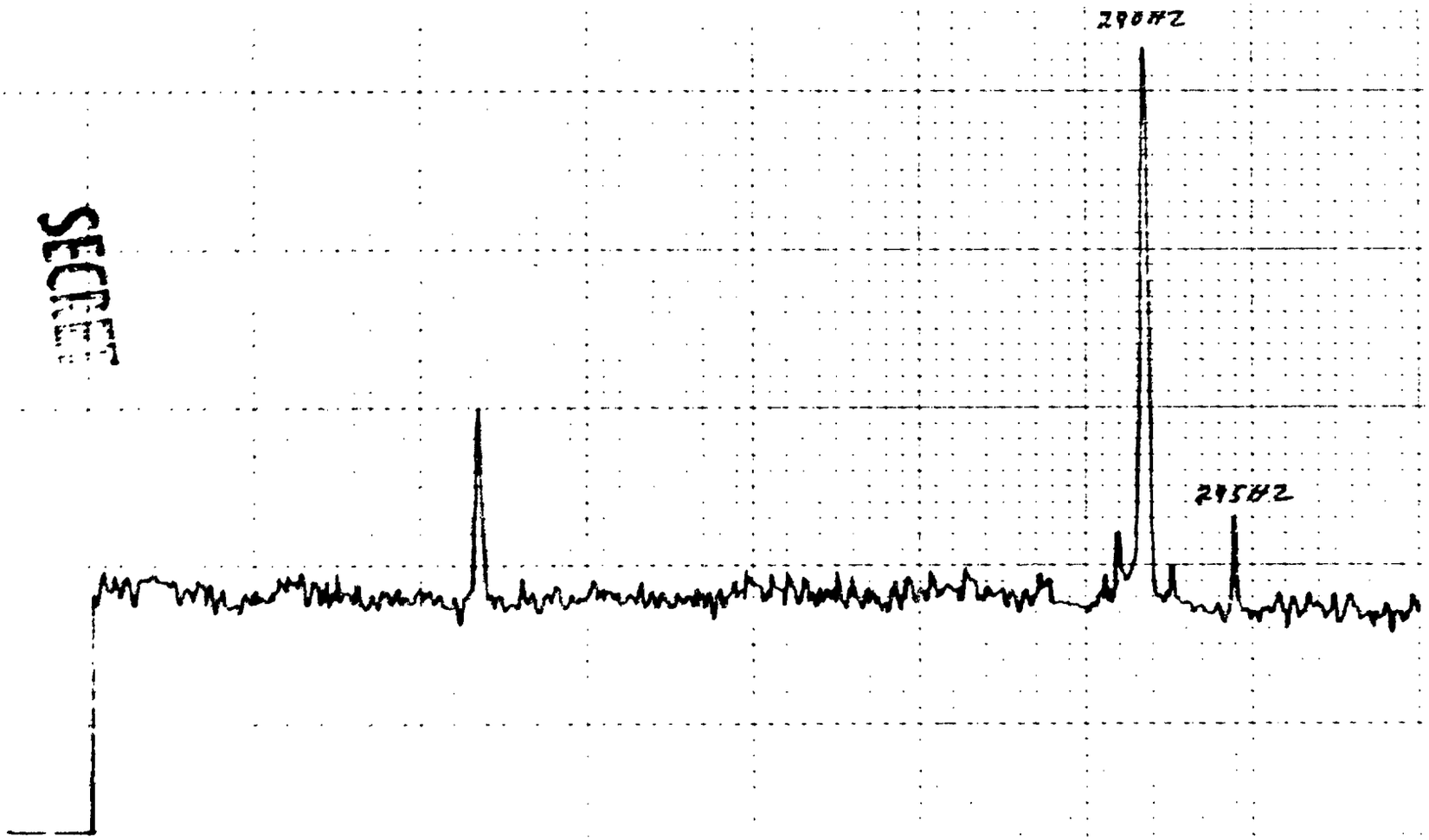


CONTROL: 0202- 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-19.5 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING



SECRET

SECRET

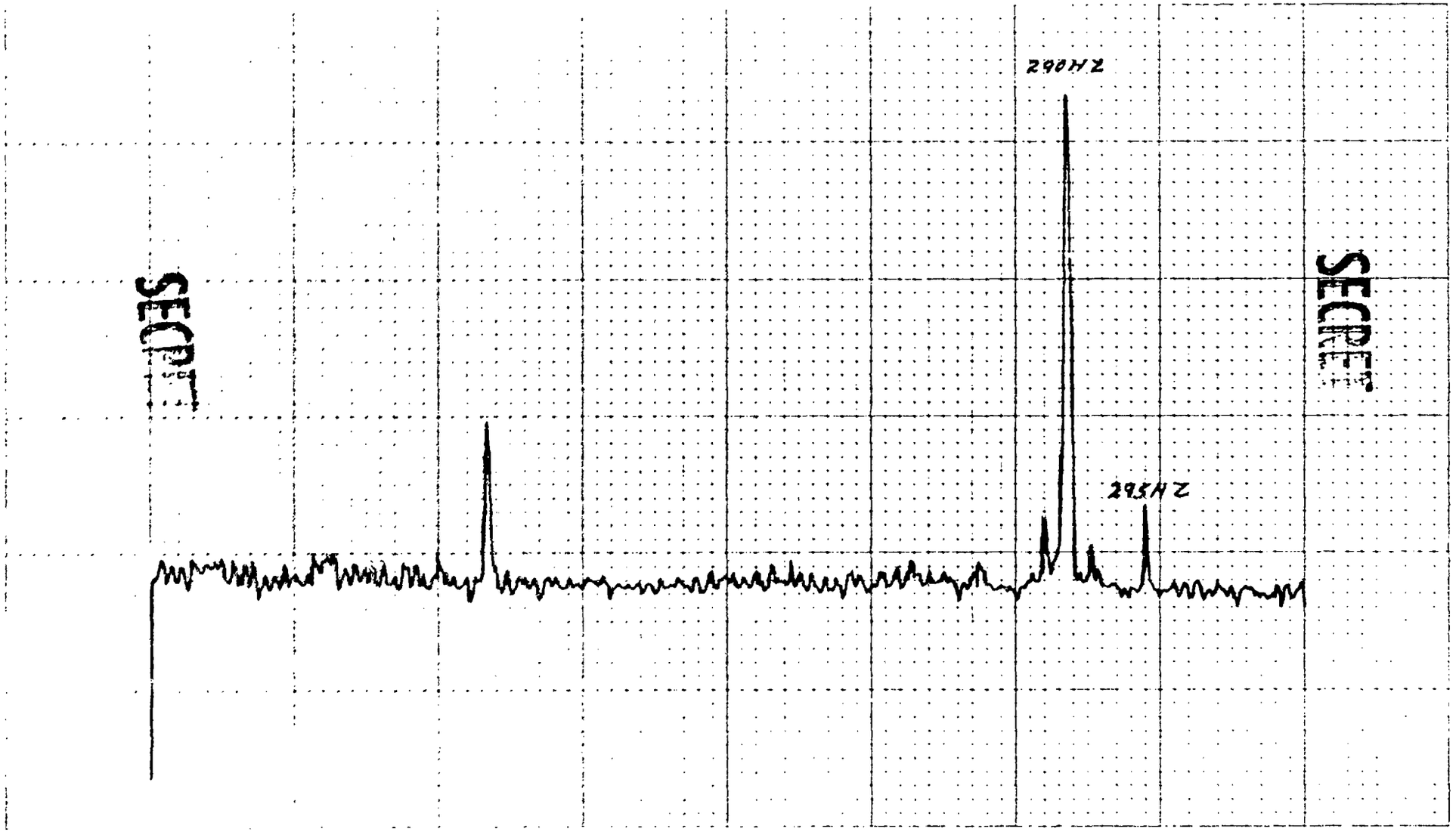
46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-20 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
ATTEN: 24 DB
FILTER WTG: HANNING

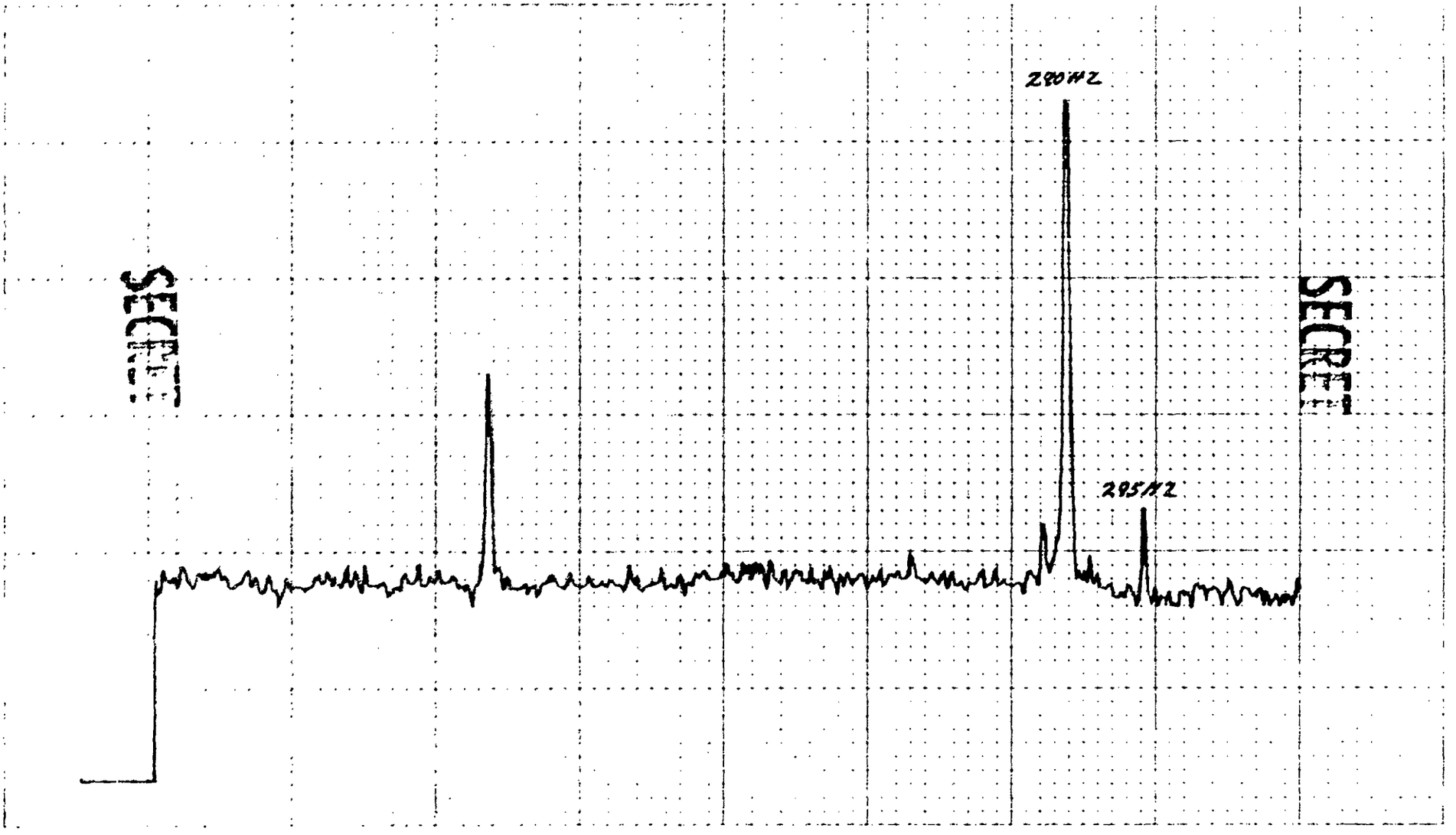


CONTROL: 0202 - 16 (D#7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS:
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-22 DEG. AZ STEERING

REEL: INDEX

INTEGRATION TIME 320 SECS ATTEN: DB
FILTER WTG: HANNING



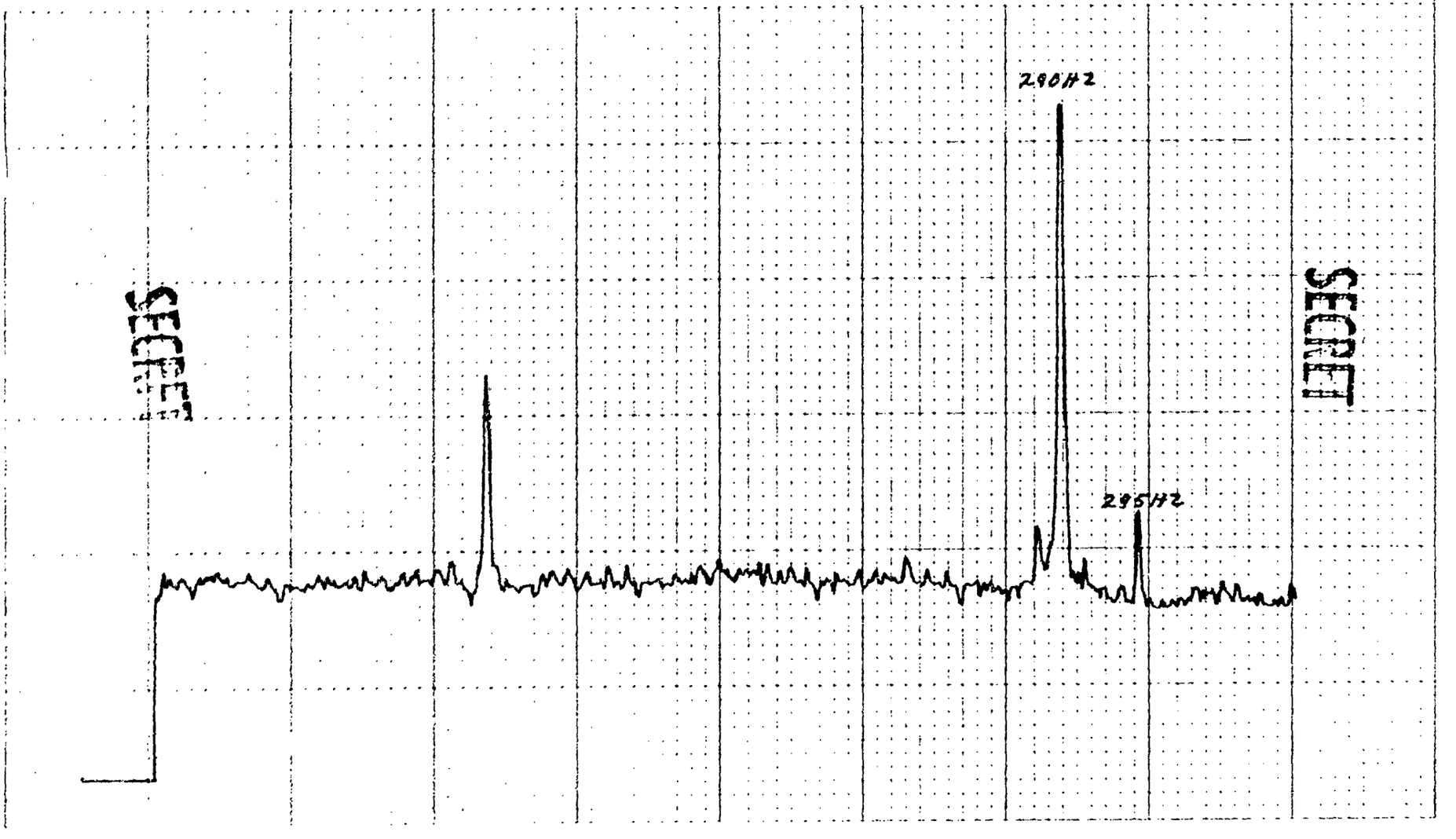
46 0703

CONTROL: 0202-16 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-24 DEG. AZ STEERING

REEL: F#9
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -24 DB



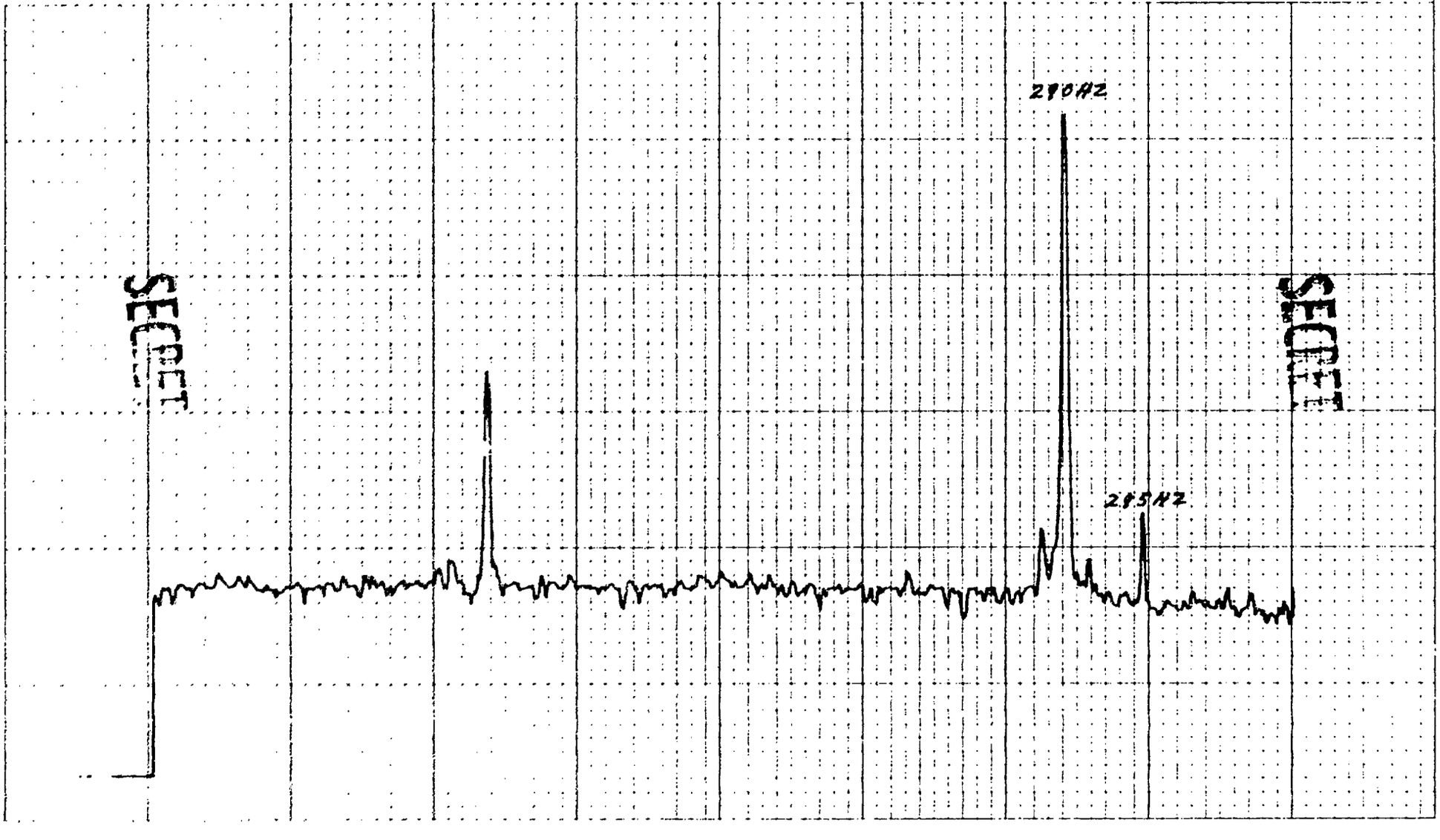
46 0703

CONTROL: 0202 - 16 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-26 DEG. AZ STEERING

REEL: F09
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING

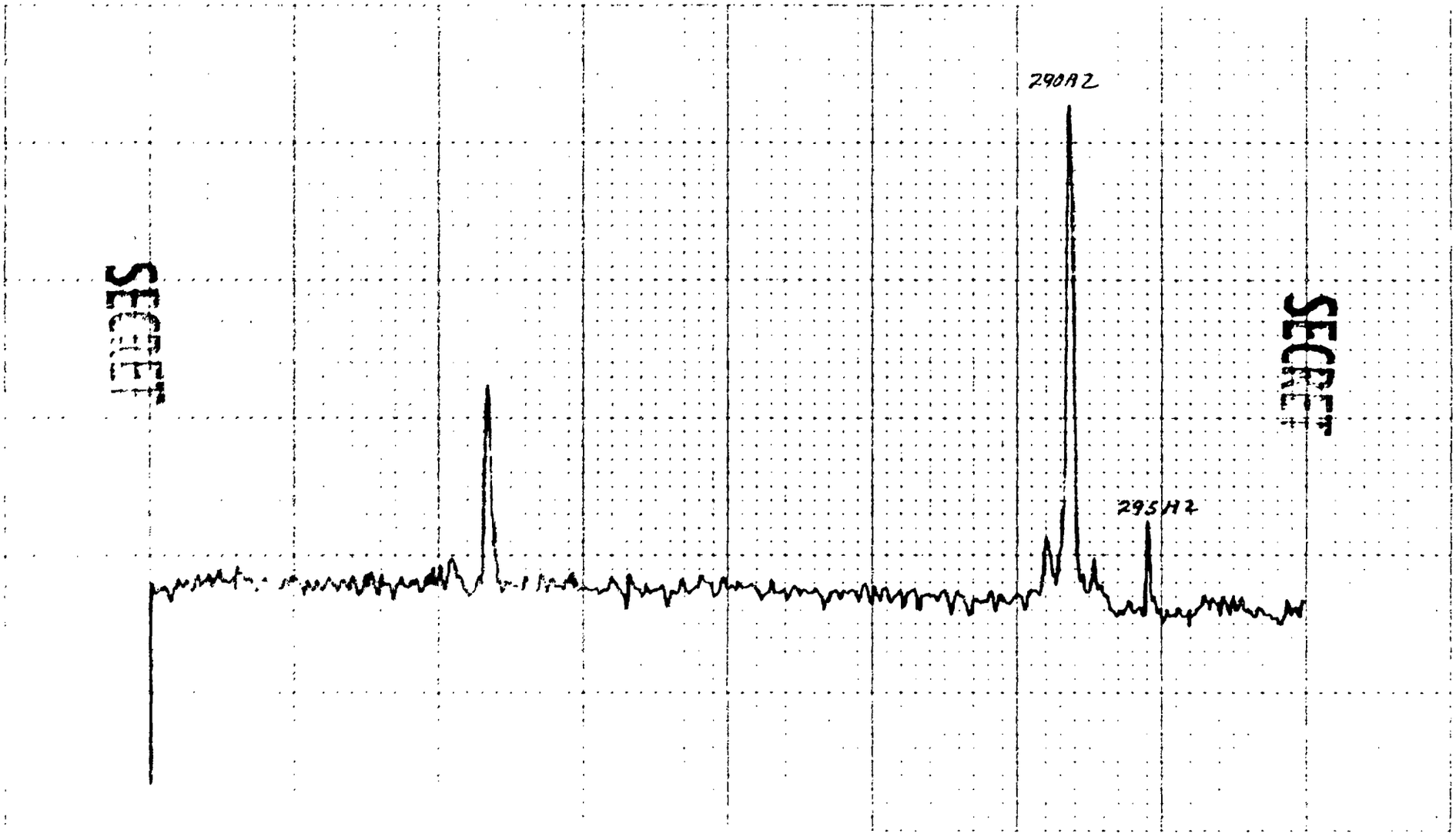


CONTROL: 0202- 16 (207)
BEAMFORMED SPECTRUM(ELEMENTS -16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-27 DEG. AZ STEERING

INTEGRATION TIME 320 SECS
FILTER WTC: HANNING

REEL: F09
INDEX 1/145
ATTEN: -24 DB



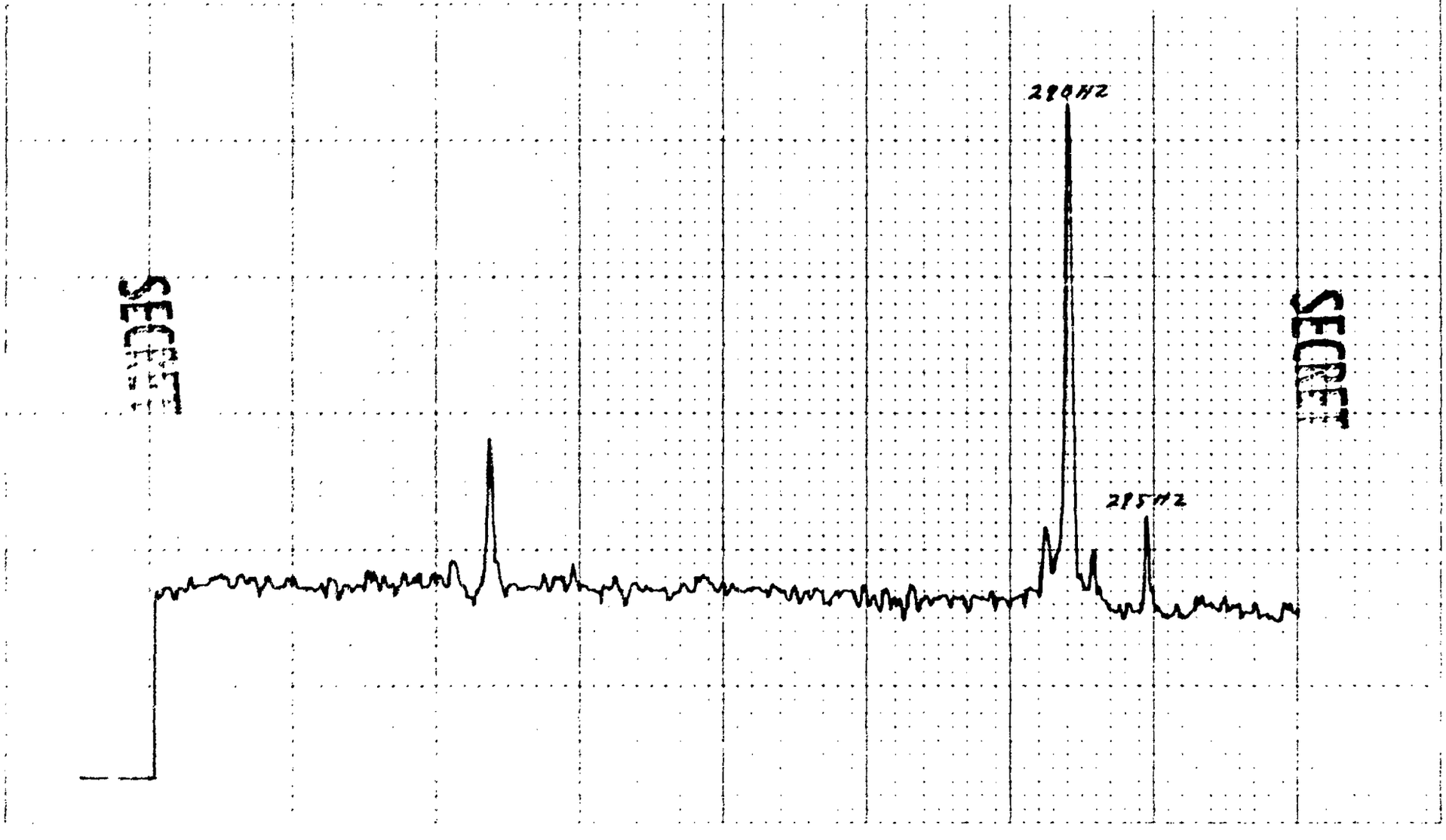
46 0703

CONTROL: 0202 - 16 (007)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 02022
ANALYSIS BANDWIDTH: 1/10HZ
-28 DEG. AZ STEERING

REEL: F23
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING



0703

CONTROL: 0202 - 16 (007)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 290 HZ
16 ELEMENTS

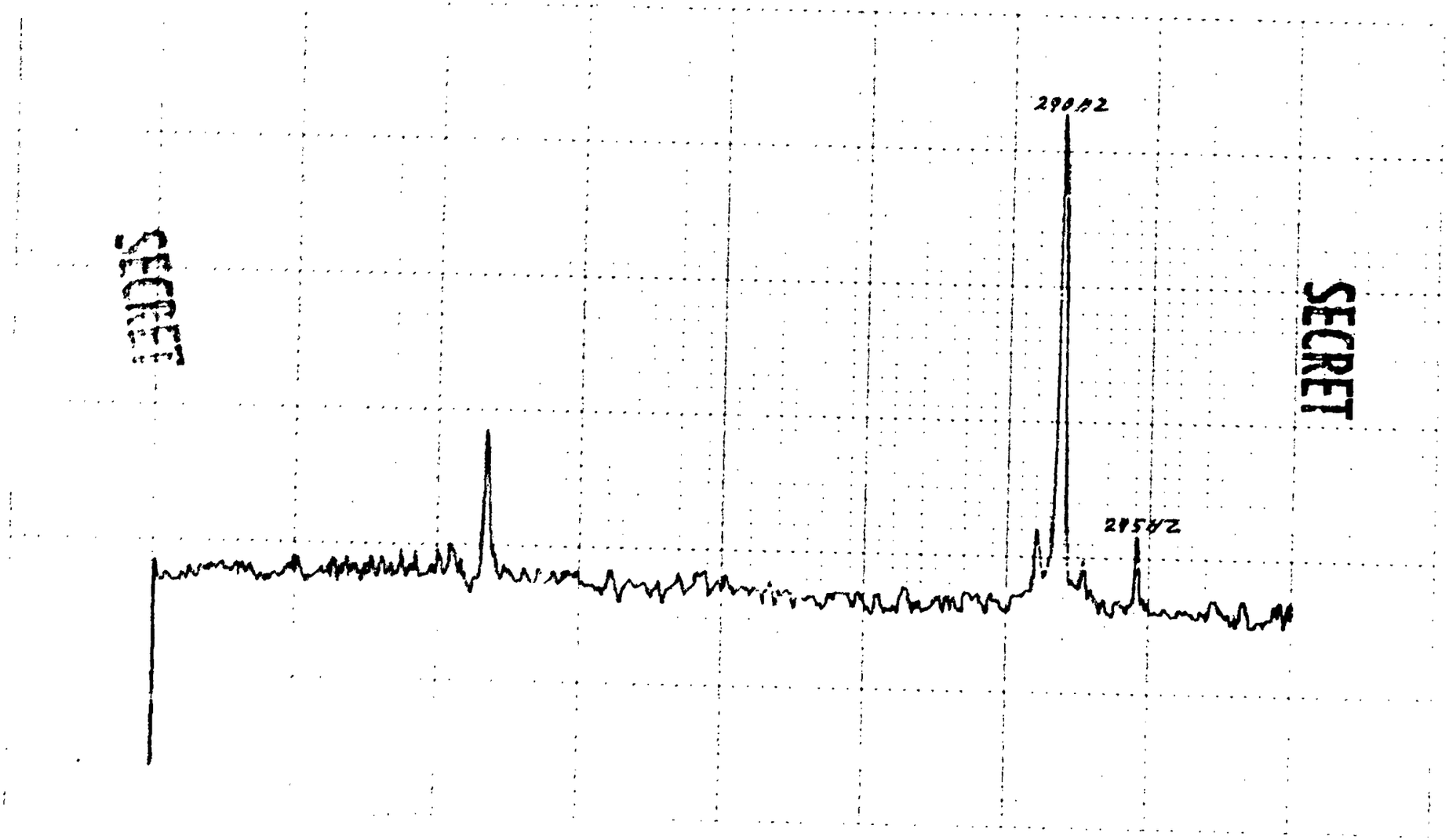
DATE OF ANALYSIS: - - -
1-16
DATE/TIME: 28-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-29 DEG. AZ STEERING

REEL: F29

INTEGRATION TIME 320 SECS
FILTER

INDEX 1145

ATTEN: -24 DB
WTG: HANNING

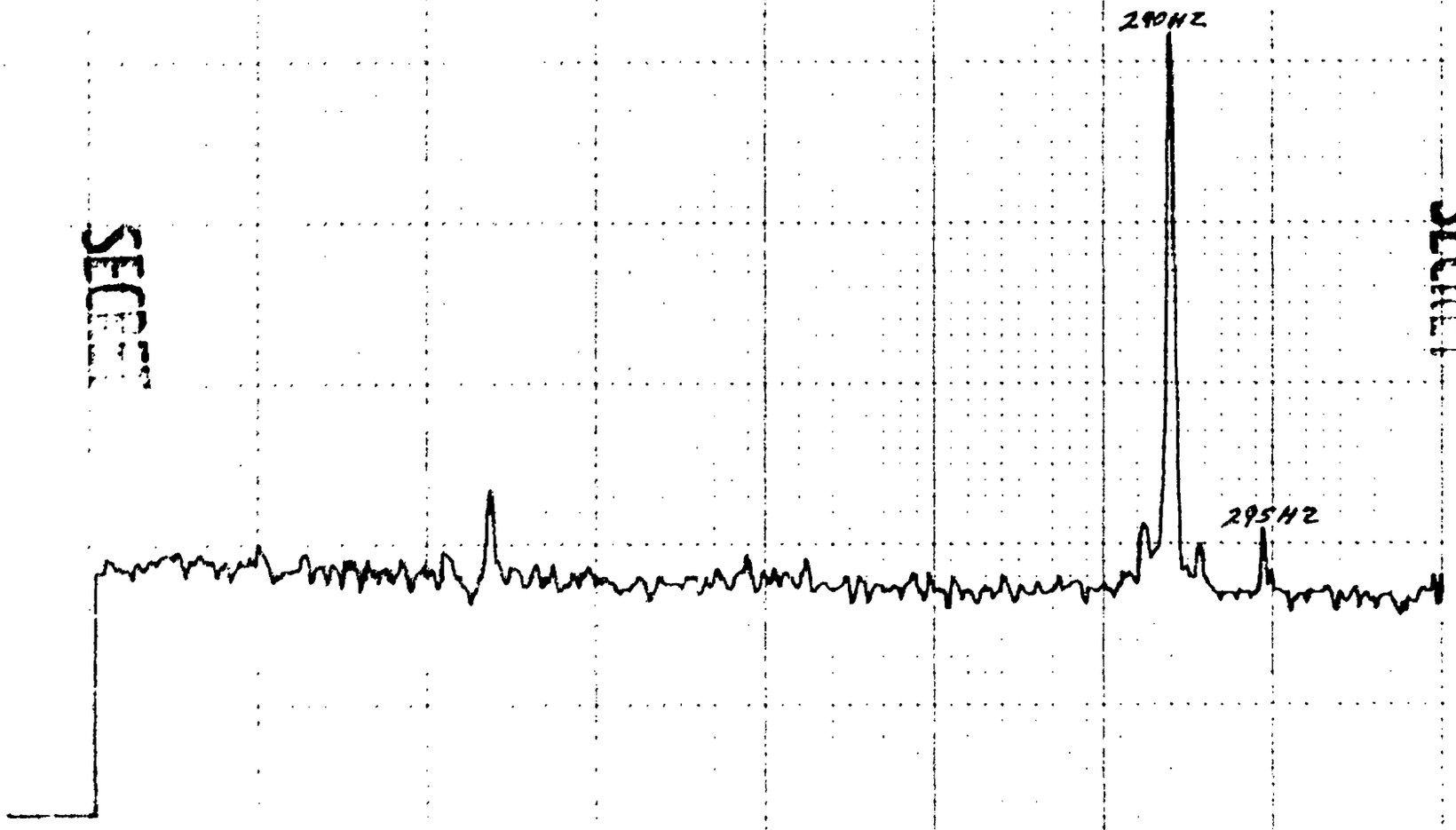


CONTROL: 0262 - 16 (D27)
BEAMFORMED SPECTRUM: ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: 1-16
DATE/TIME: 2-8 77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-30 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -24 DB
WTG: HANNING

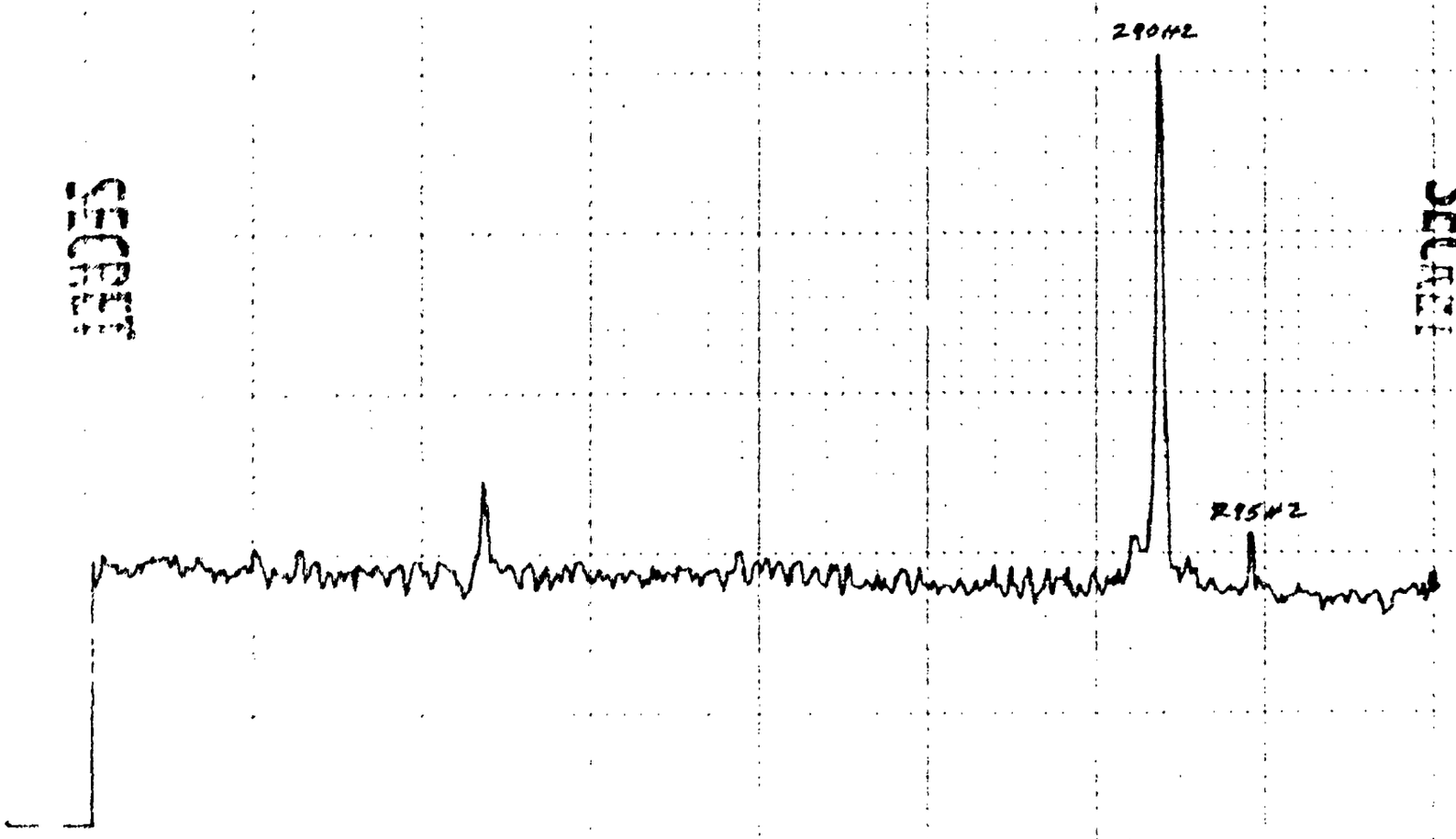


CONTROL: 0202 - 16 (007)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAFE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS:
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-32 DEG. AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: -24 DB
FILTER WIG: HANNING



46 0703

CONTROL: 0202-16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-34 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

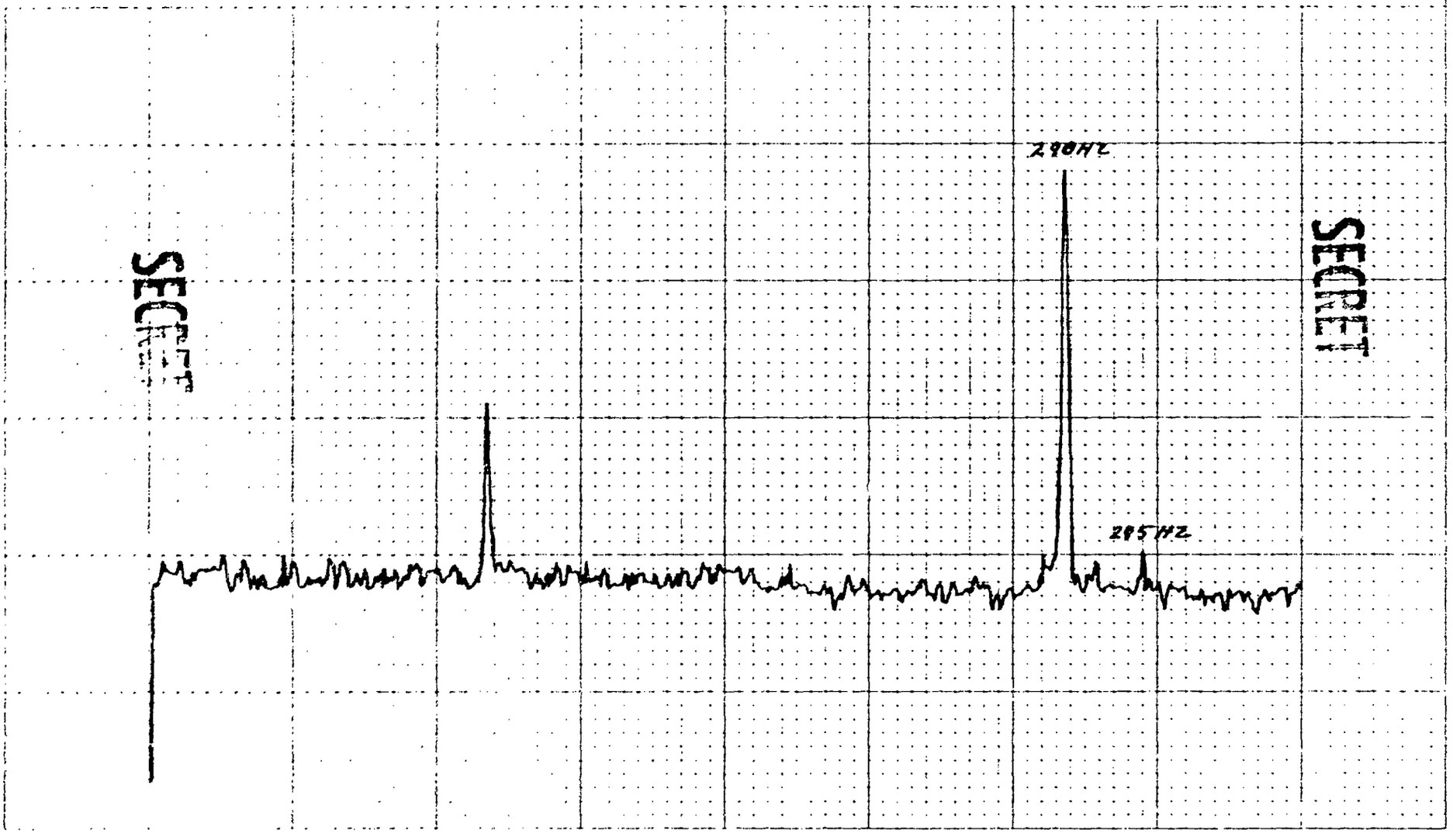
INDEX 1145
ATTEN: -24 DB
WTG: HANNING

CONTROL: 0202 - 16 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-36 DEG. AZ STEERING

REEL: F39
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -24 DB



CONTROL: 0202 - 16 (B07)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: 1-16
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-30 DEG. AZ STEERING

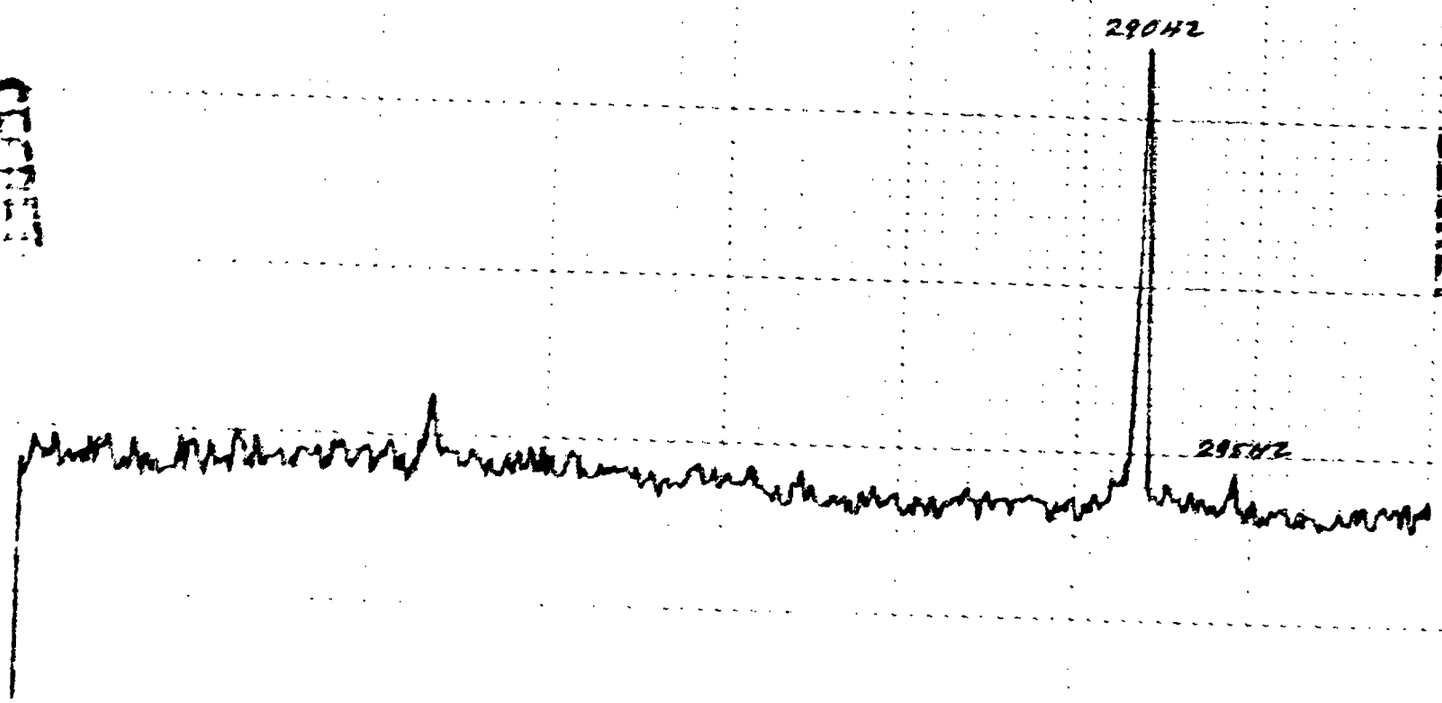
INTEGRATION TIME 320 SECS
FILTER

REEL: F29

INDEX 1145

ATTEN: -24 DB
WTG: HANNING

SECRET



SECRET

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 7 FREQUENCY 140 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-25.1	
MCPS-32 CAL. CORRECTION	+10	-15.1	
BEAMFORMER GAIN	+30	+14.9	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .2	+15.1	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-67.3	
MCPS-32 CAL. CORRECTION	+10	-57.3	
BEAMFORMER GAIN	+30	-27.3	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+14.9	
SIGNAL LEVEL FOR SNR	-27.3	42.2	
PROCESSOR CORRECTION	-4.0	38.2	
MRA CORRECTION	+ .2	38.4	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	30	SNR 1 HZ BAND

CONFIDENTIAL

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 7 FREQUENCY 290 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-28.5	
MCPS-32 CAL. CORRECTION	+10	-18.5	
BEAMFORMER GAIN	+30	+11.5	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	+12.3	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-73.8	
MCPS-32 CAL. CORRECTION	+10	-63.8	
BEAMFORMER GAIN	+30	-33.8	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+11.5	
SIGNAL LEVEL FOR SNR	-33.8	45.3	
PROCESSOR CORRECTION	-4.0	40.3	
MRA CORRECTION	+ .8	41.1	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	32.9	SNR 1 HZ BAND

CONFIDENTIAL

SECTION 4

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 7 FREQUENCY 295 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-64.7	
MCPS-32 CAL. CORRECTION	+10	-54.7	
BEAMFORMER GAIN	+30	-24.7	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	-23.9	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-73.6	
MCPS-32 CAL. CORRECTION	+10	-63.6	
BEAMFORMER GAIN	+30	-33.6	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-24.7	
SIGNAL LEVEL FOR SNR	-33.6	8.9	
PROCESSOR CORRECTION	-4.2	4.7	
MRA CORRECTION	+ .8	5.5	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	-2.7	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 7

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-16.0	-17.5	
MRA SIGNAL LEVEL	+15.1	+12.3	-23.9
ARRAY SIGNAL GAIN	31.1	29.8	
20 LOG 32 (# of elements)	30.1	30.1	
DIFFERENCE	+1.0	-.3	

ARRAY GAIN

MRA SNR	38.4	41.1	5.5
MEAN OMNI SNR	30.1	32.5	
ARRAY GAIN	8.3	8.6	
THEORETICAL AZMUTH GAIN (at MRA)	12.5	14.7	15.1
DIFFERENCE	-4.2	-6.1	

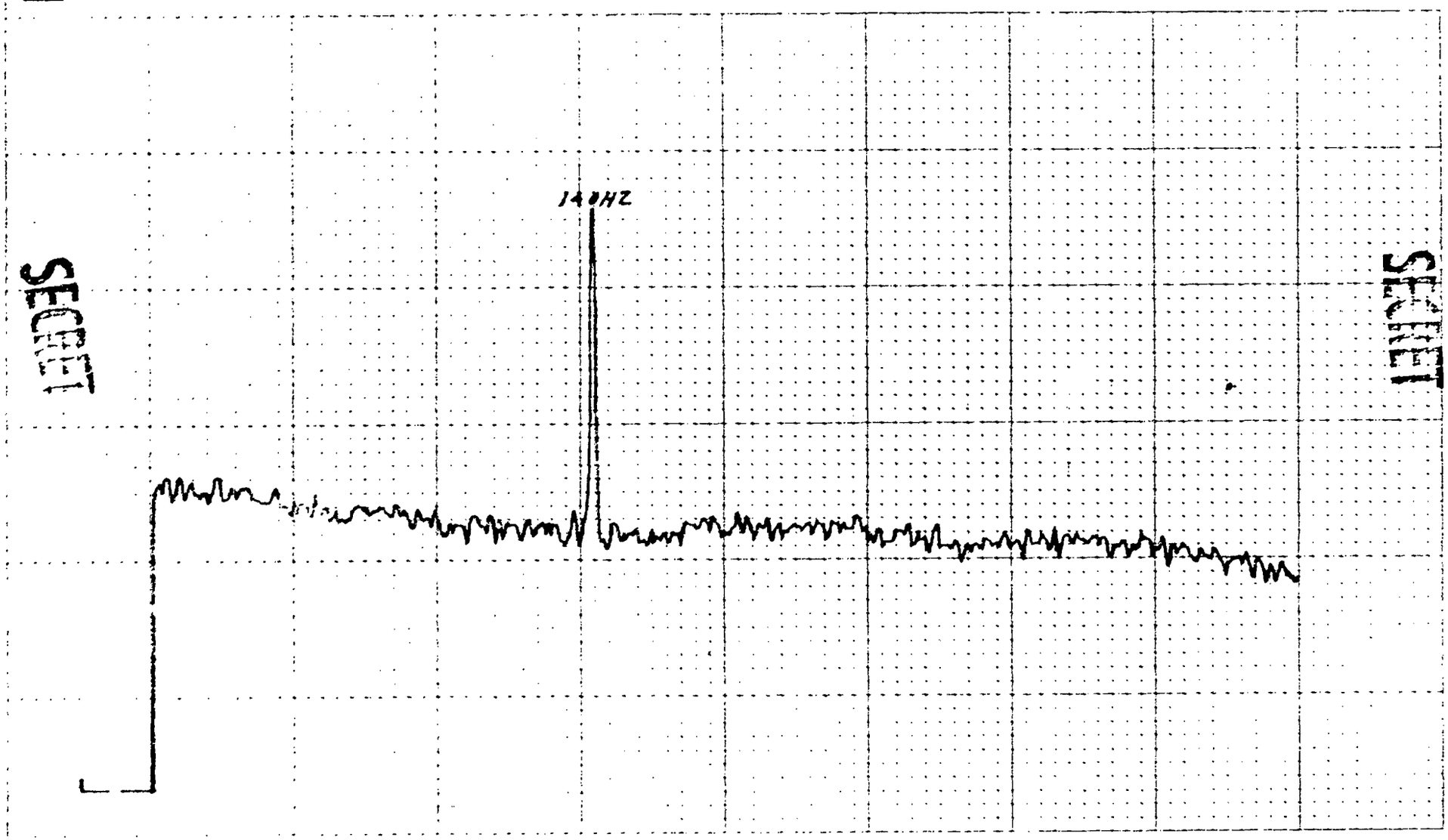
46 0703

CONTROL: 0202 - 32 (DPT)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-12 DEG. AZ STEERING

REEL: F09
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

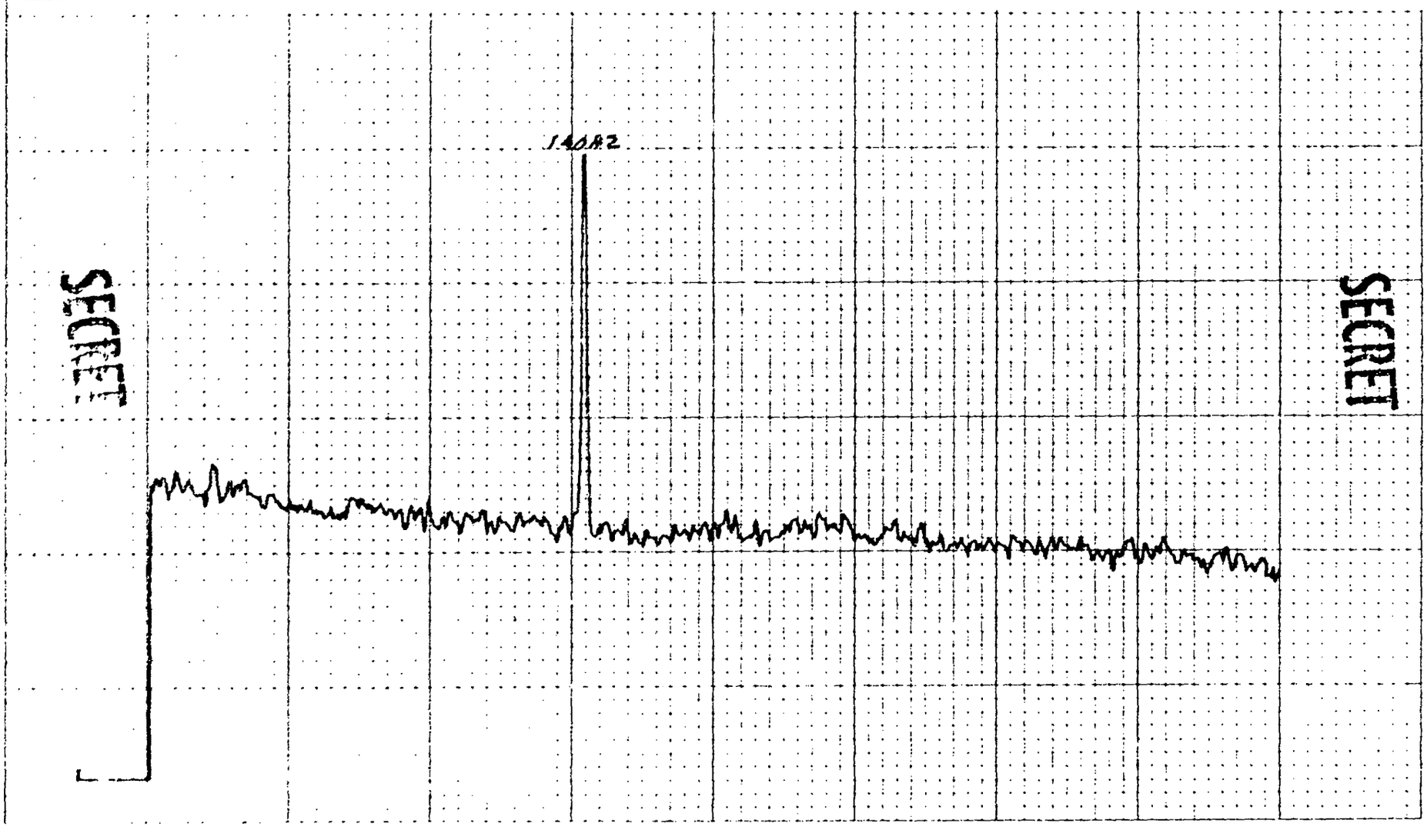


CONTROL: 0202-32 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-14 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX/195
ATTEN: -20DB

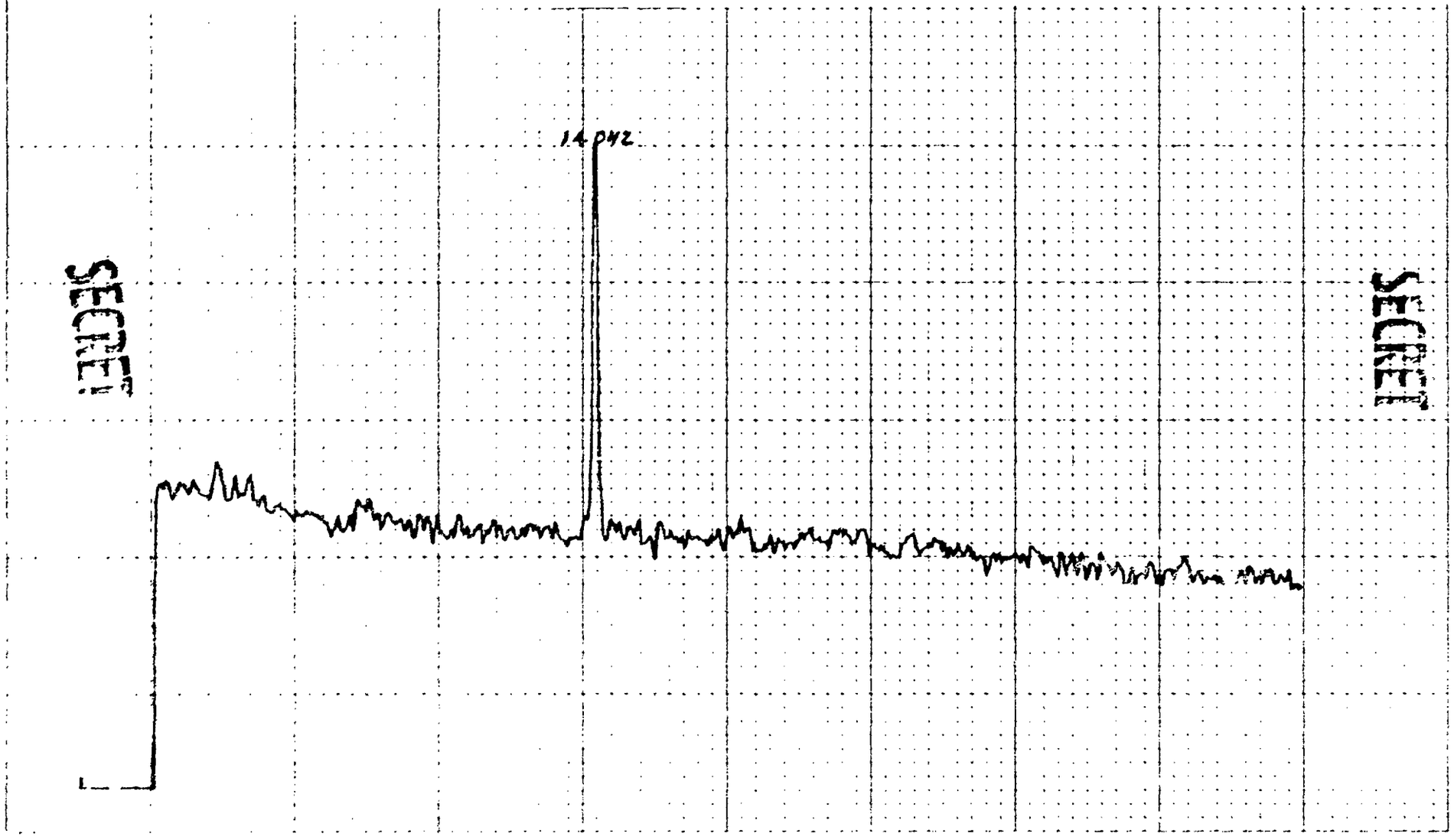


CONTROL: 0202 - 32 (DT7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-16 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX/145
ATTEN: -30 DB



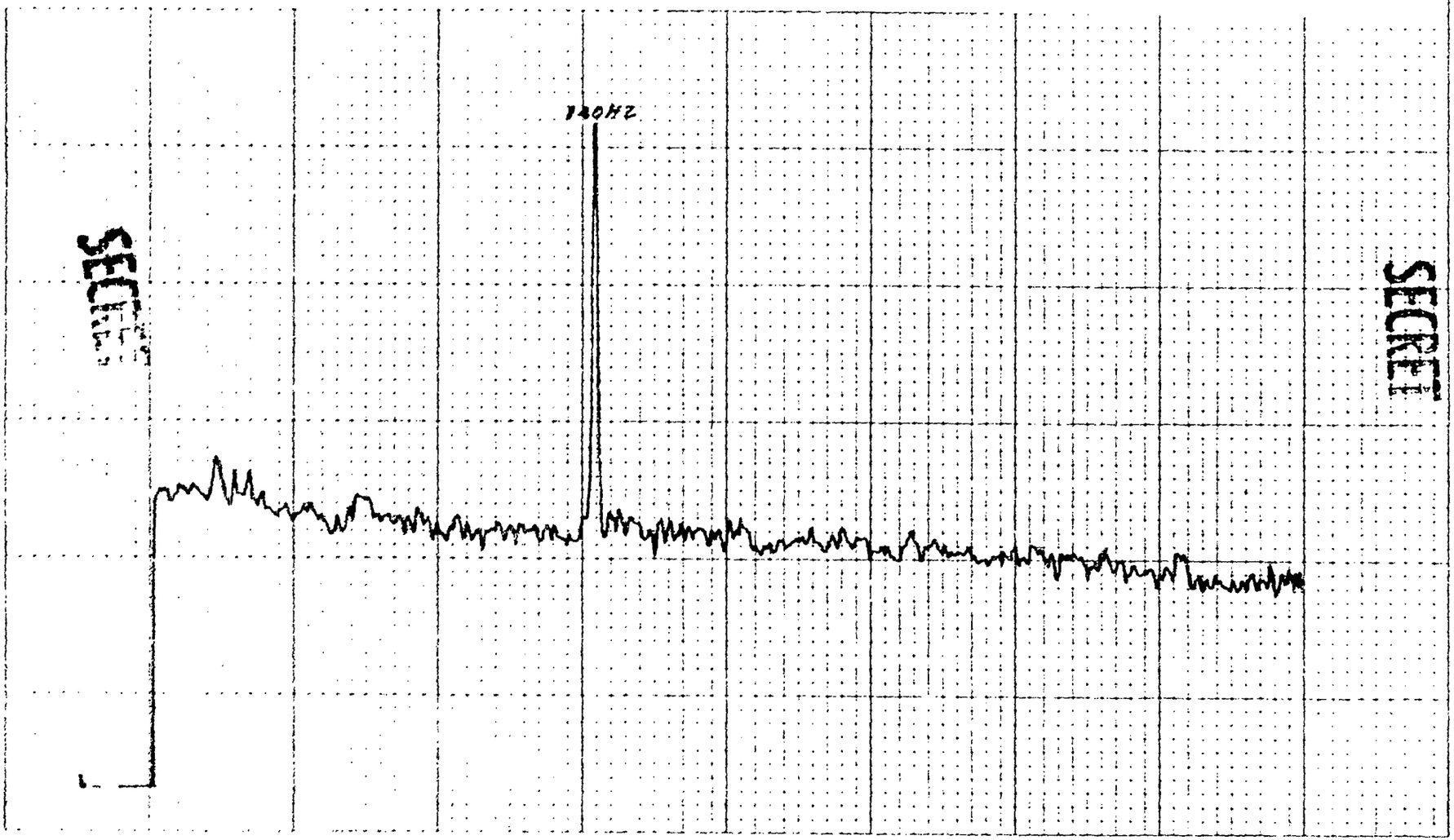
46 0703

CONTROL: 0202-32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 -02022
ANALYSIS BANDWIDTH: 1/10HZ
-10 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30DB
WTG: HANNING



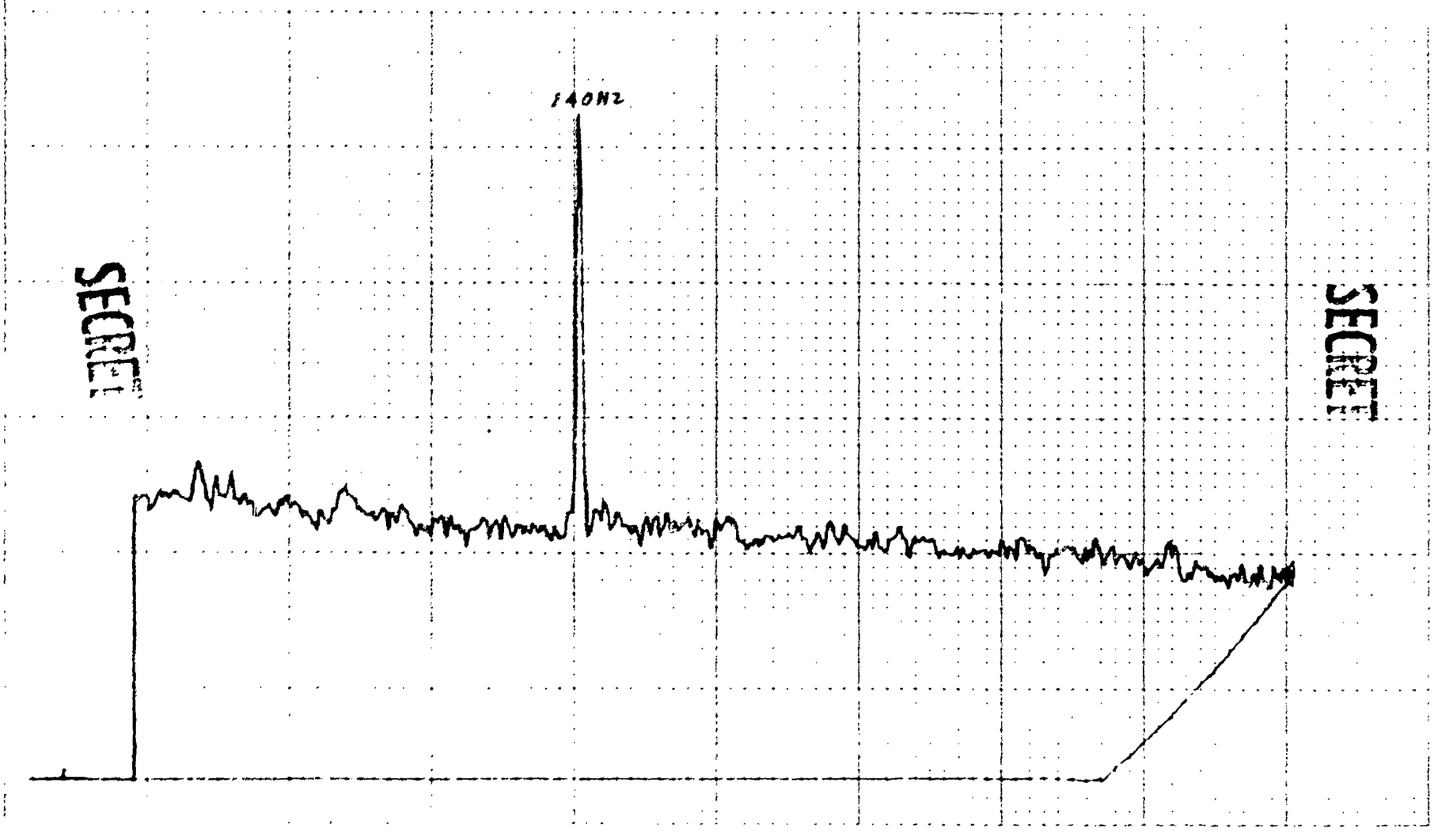
46 0703

CONTROL: 0202-32 (DB7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10 Z
-20 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



46 0703

CONTROL: 0202-32 (D07)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

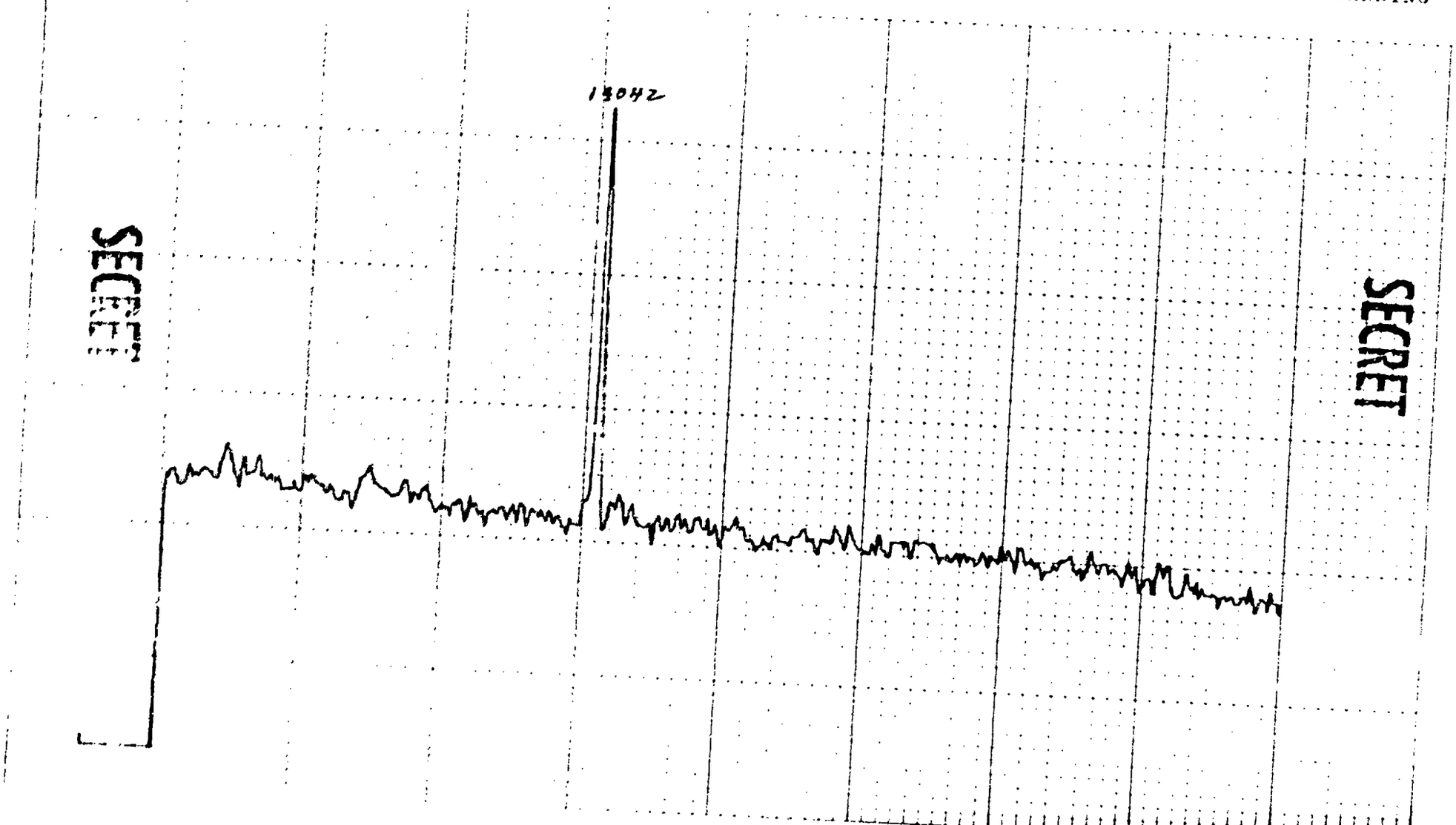
DATE OF ANALYSIS: 1-26 & 29-34
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-21.5 DEG. AZ STEERING

REEL: F29

INTEGRATION TIME 320 SECS
FILTER

INDEX 1145

ATTEN: -70 DB
WTG: HANNING

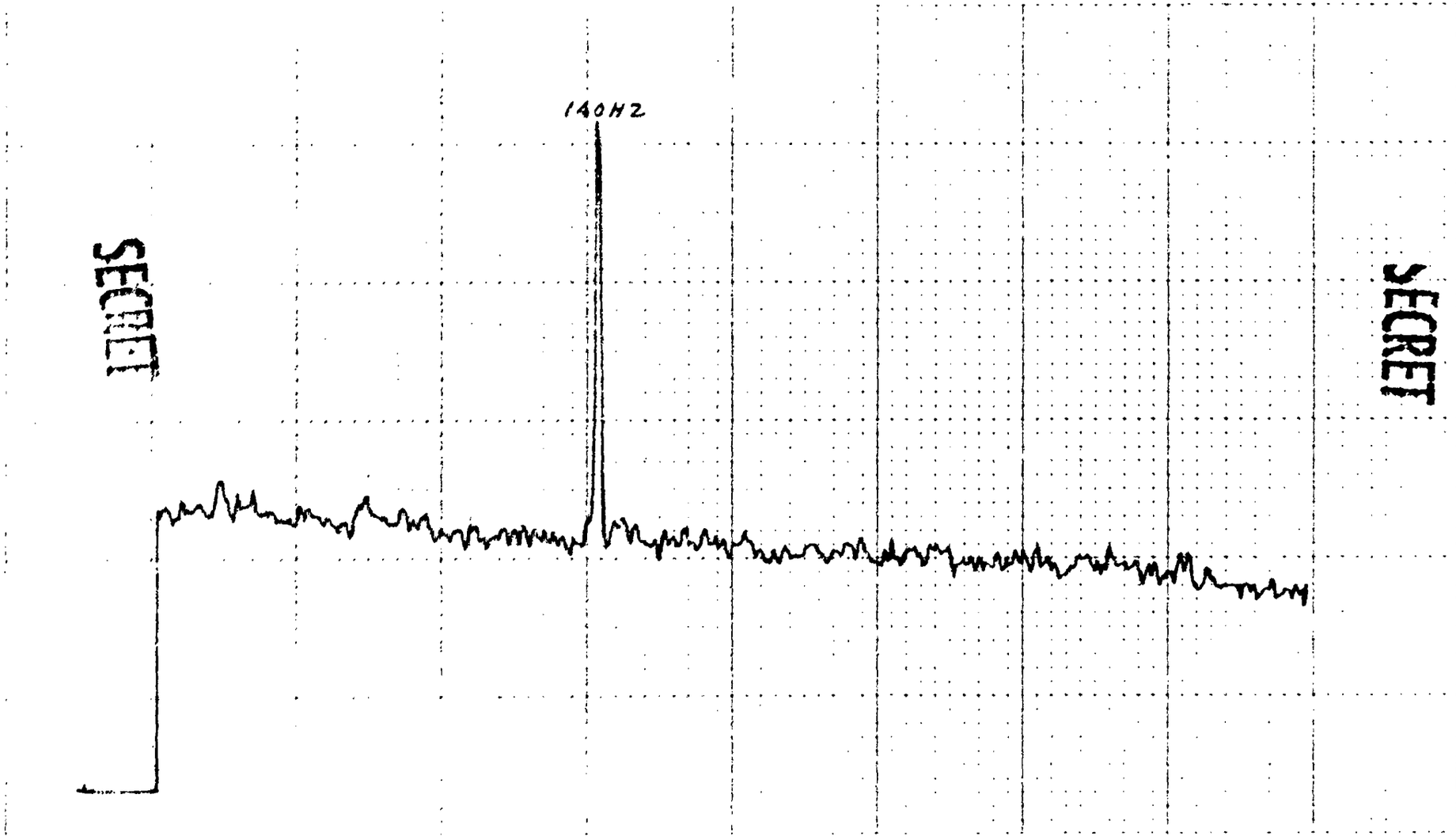


CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: 1-26 & 29-74
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-22 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



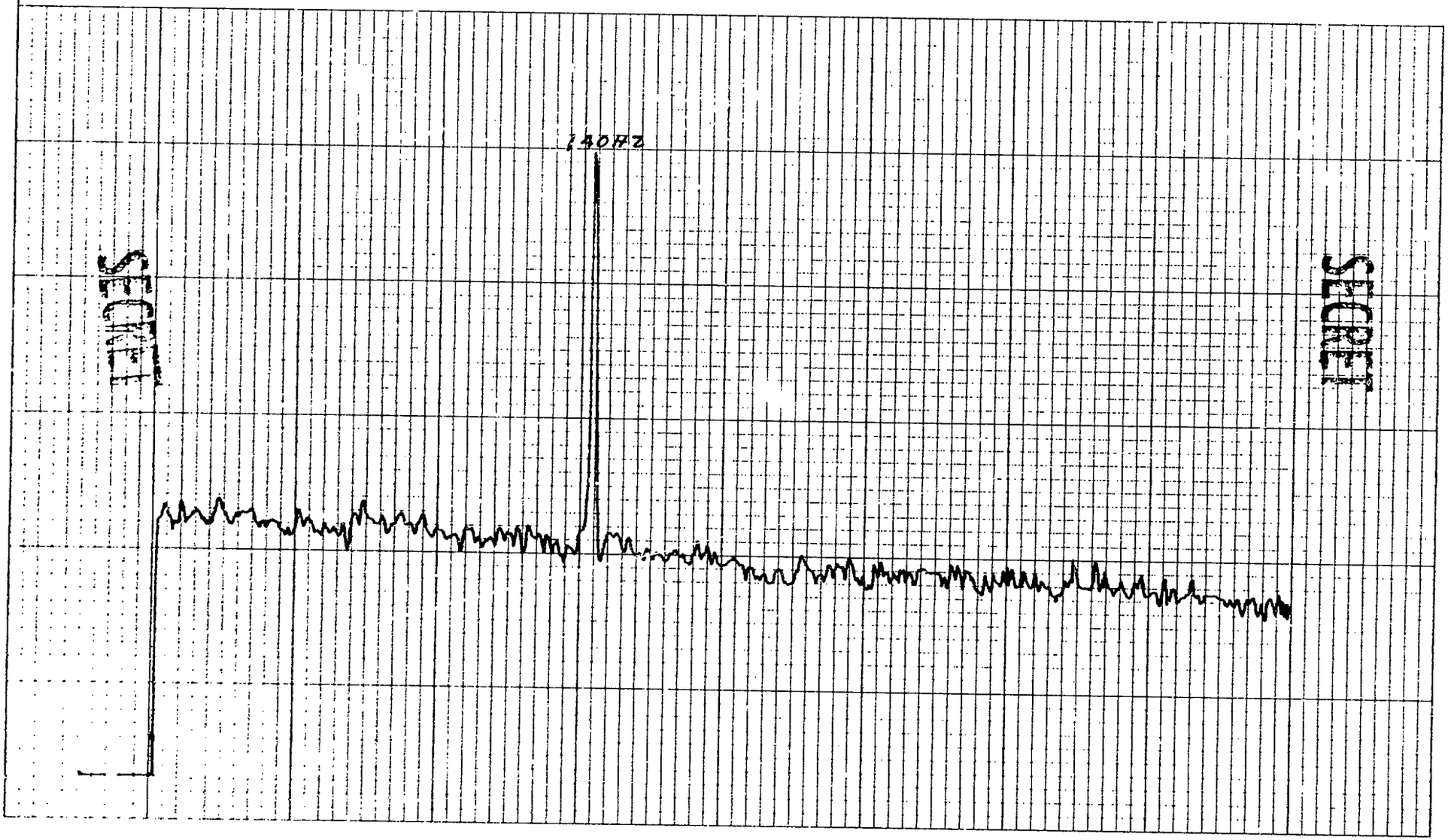
46 0703

CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-24 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



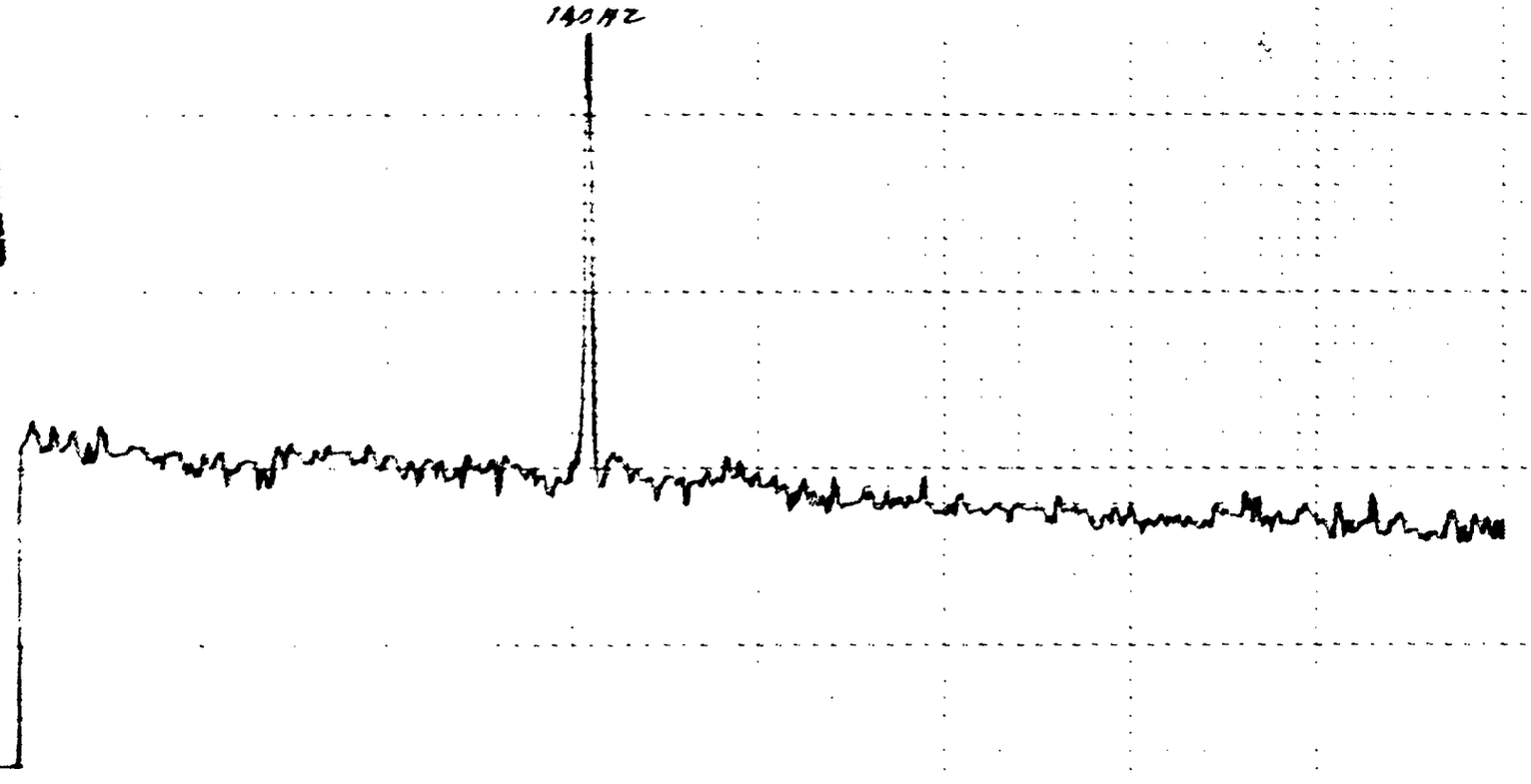
CONTROL: 0202 - 32 (BPT.
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
-26 & 89-53
DATE TIME: 2-8-72 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-26 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HAMMING

INDEX 1145
ATTEN: -30DB

SECRET



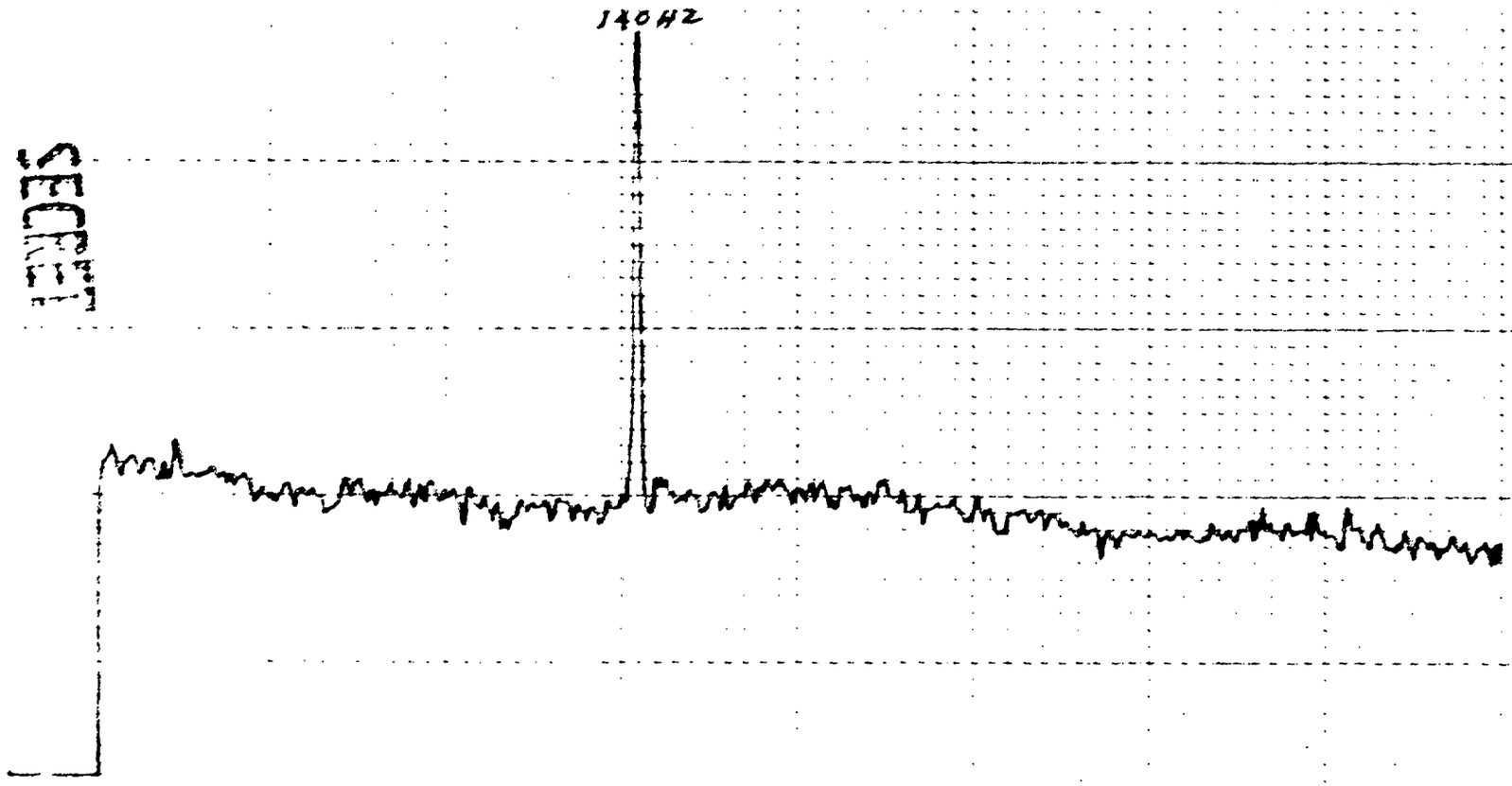
SECRET

CONTROL: 0202 - 32 (287)
BEAMFORMED SPECTRUM(ELEMENTS)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-268 29-53
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-28 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



SECRET

SECRET

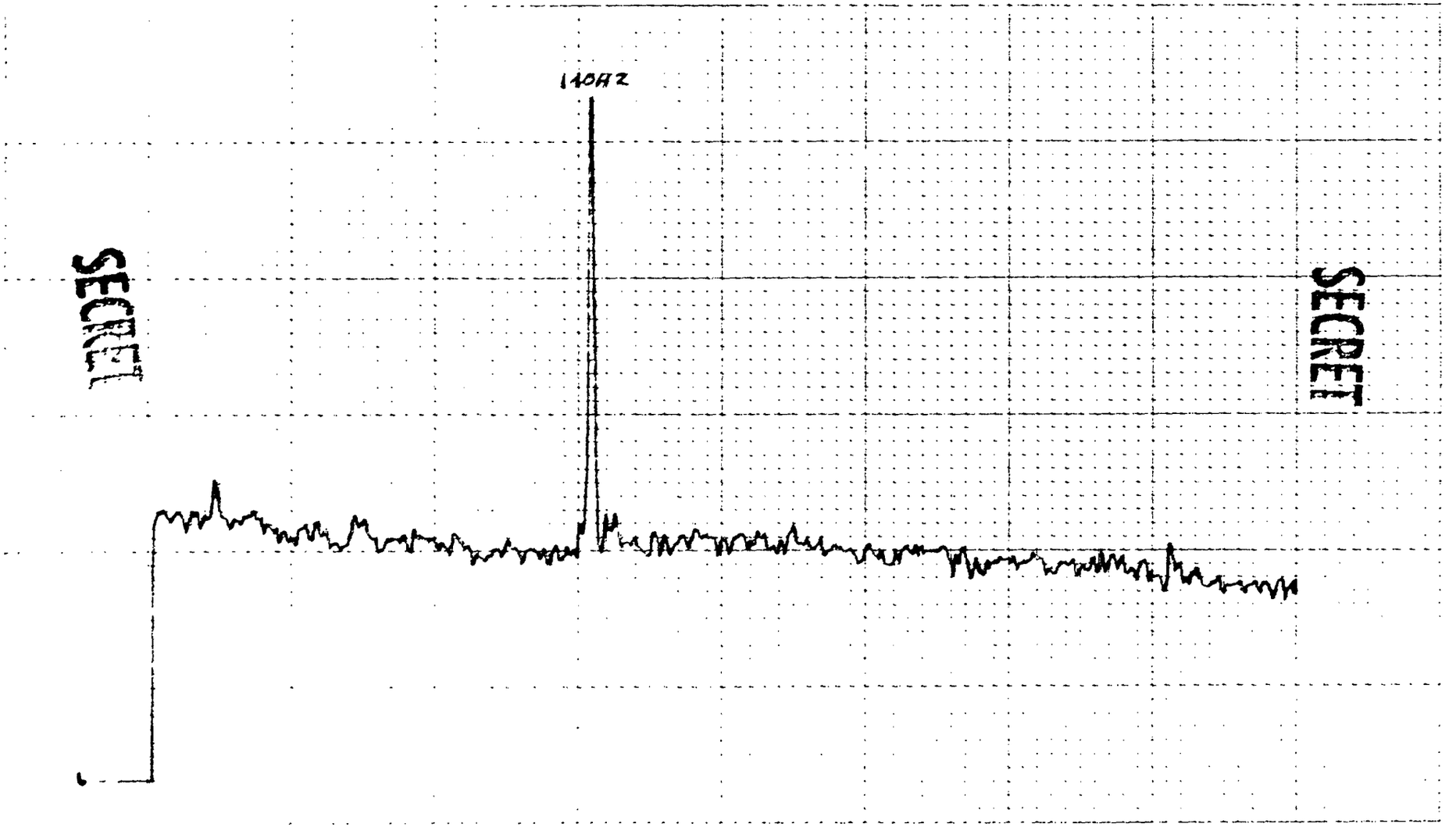
46 0703

CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-30 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -30DB



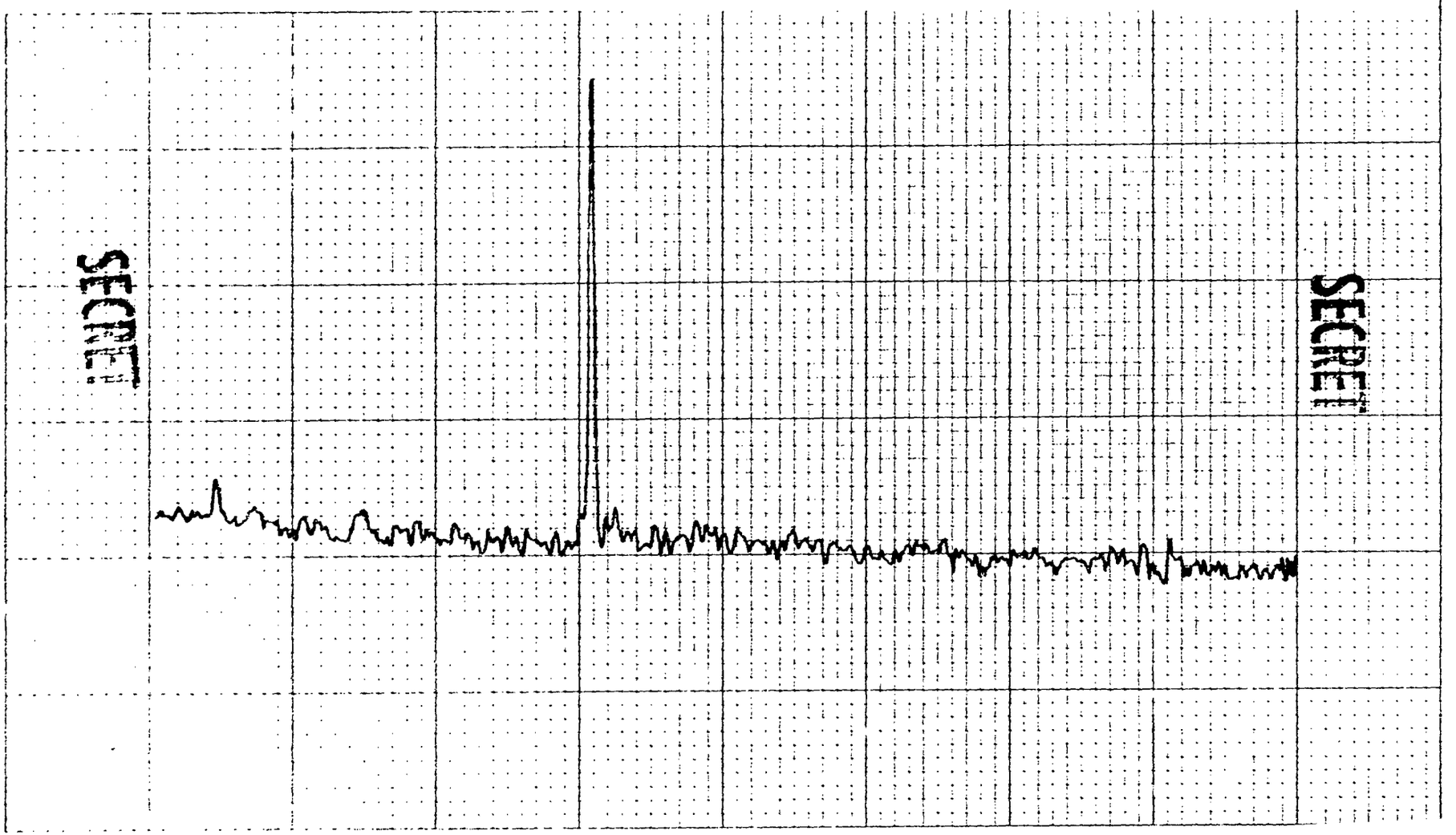
46 0703

CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-32 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX/145
ATTEN: -30 DB
WTG: HANNING

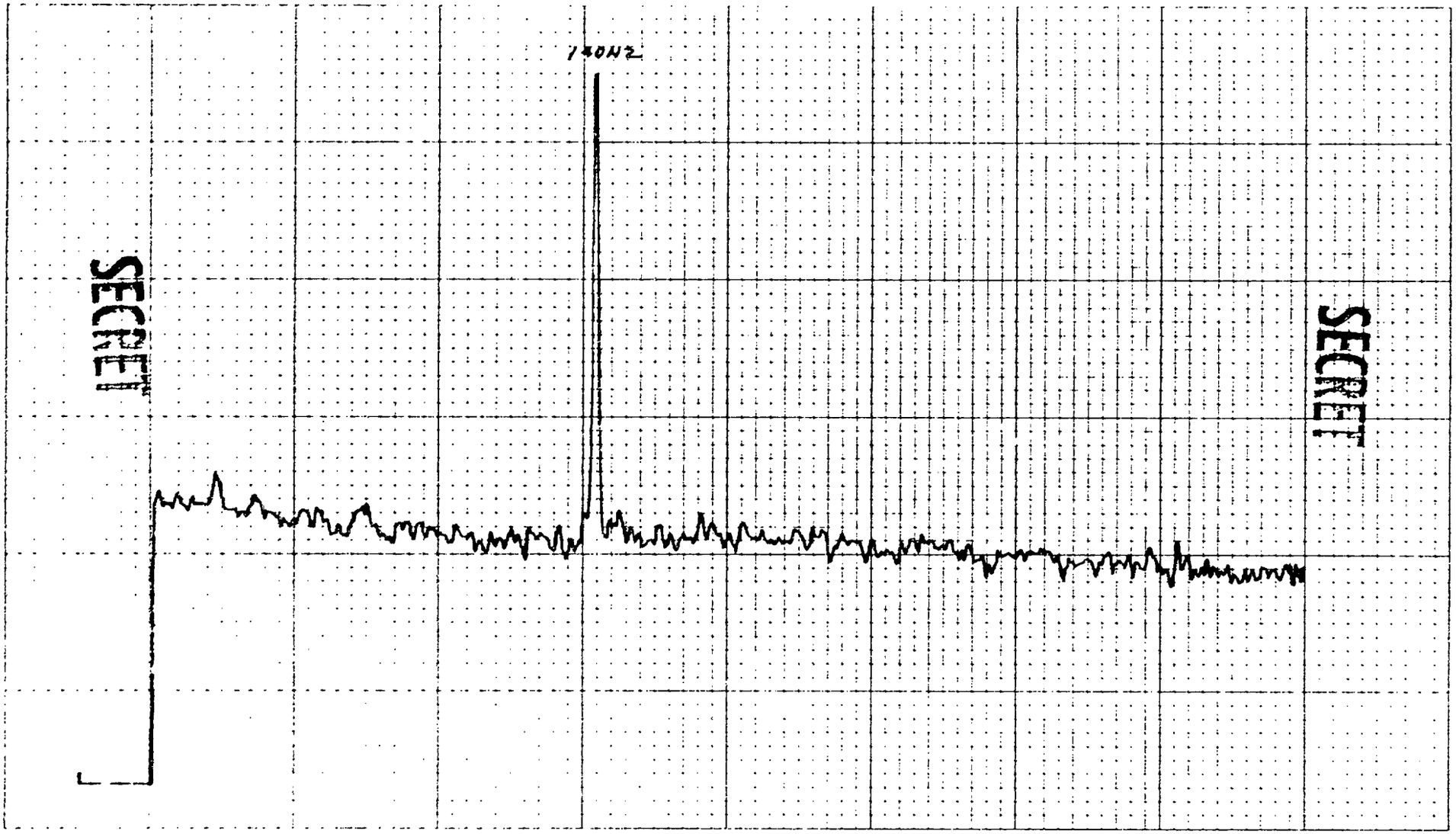


CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-33 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: 30 DB



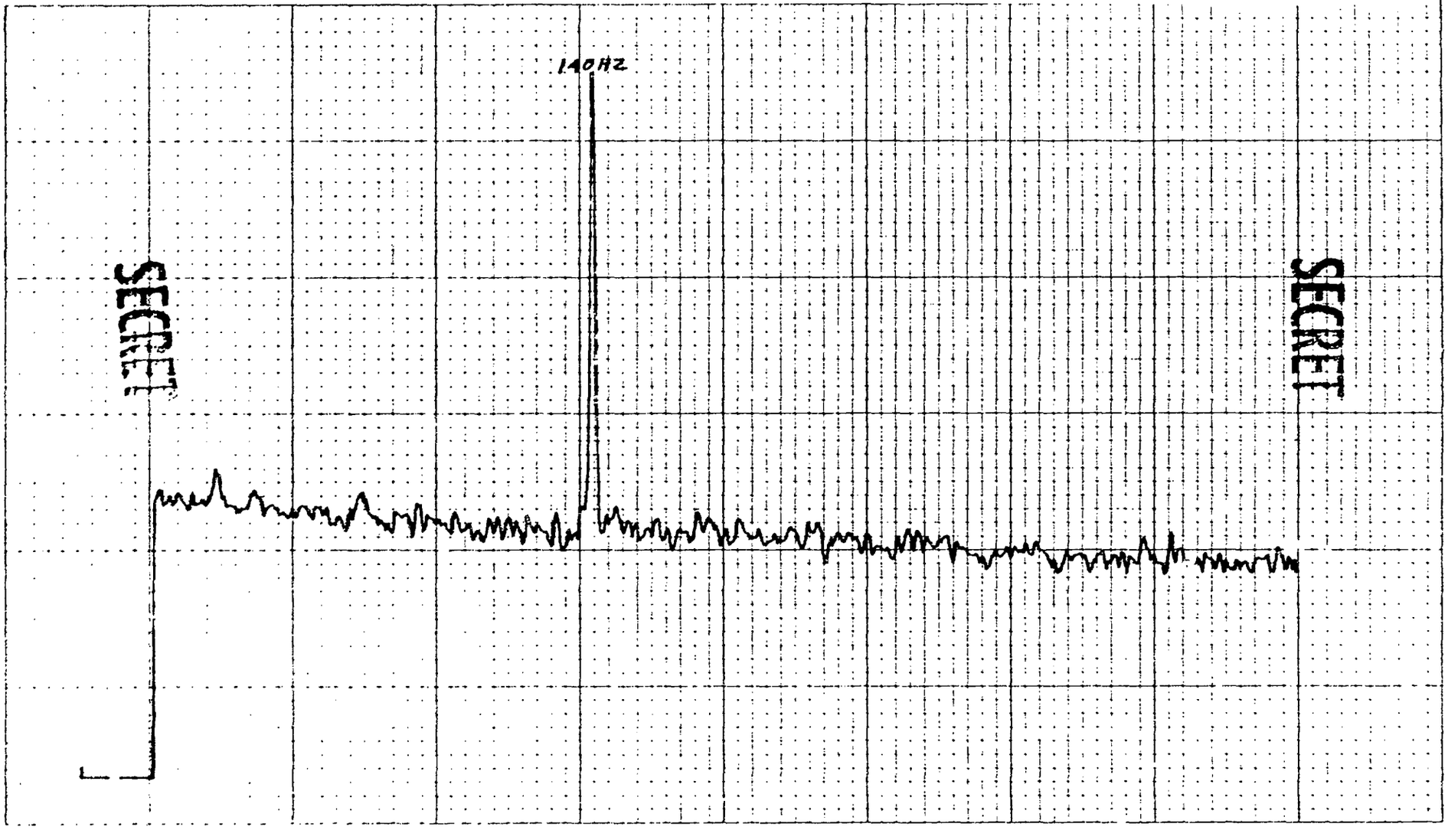
46 0703

CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-34 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



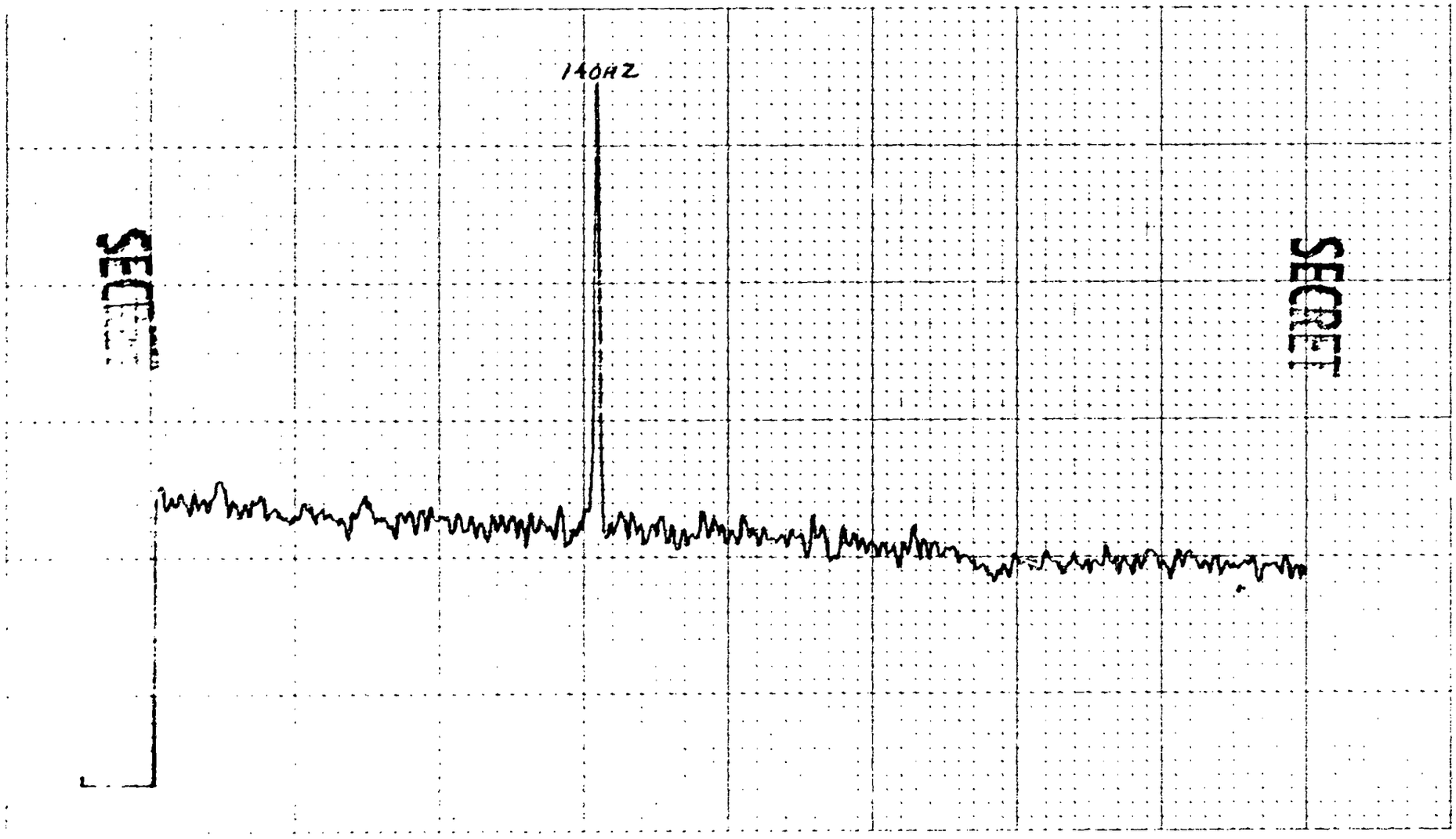
46 0703

CONTROL: 0202 - 32 (DPT)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-36 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



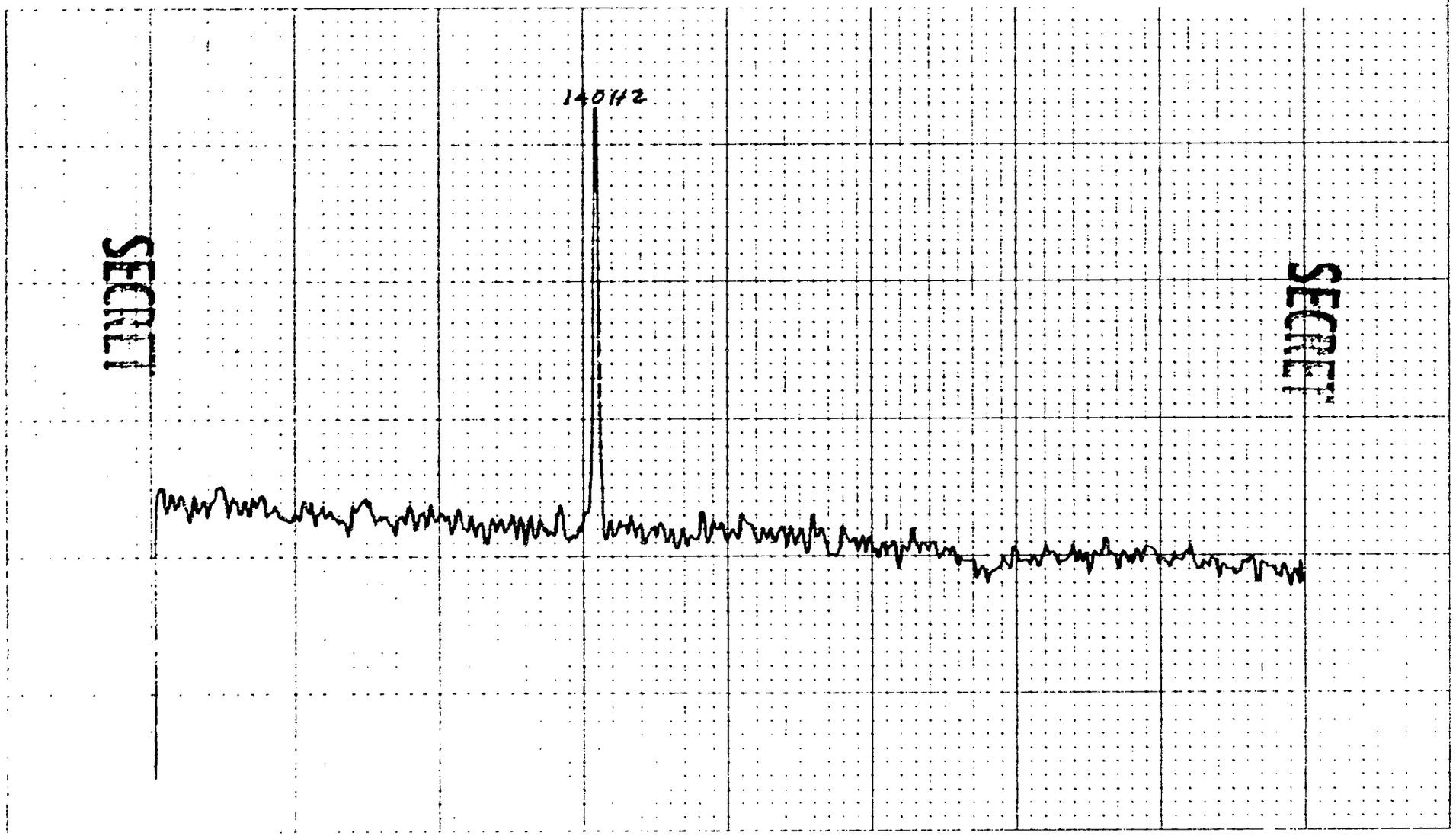
46 0703

CONTROL: 0202-32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77-0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-38 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



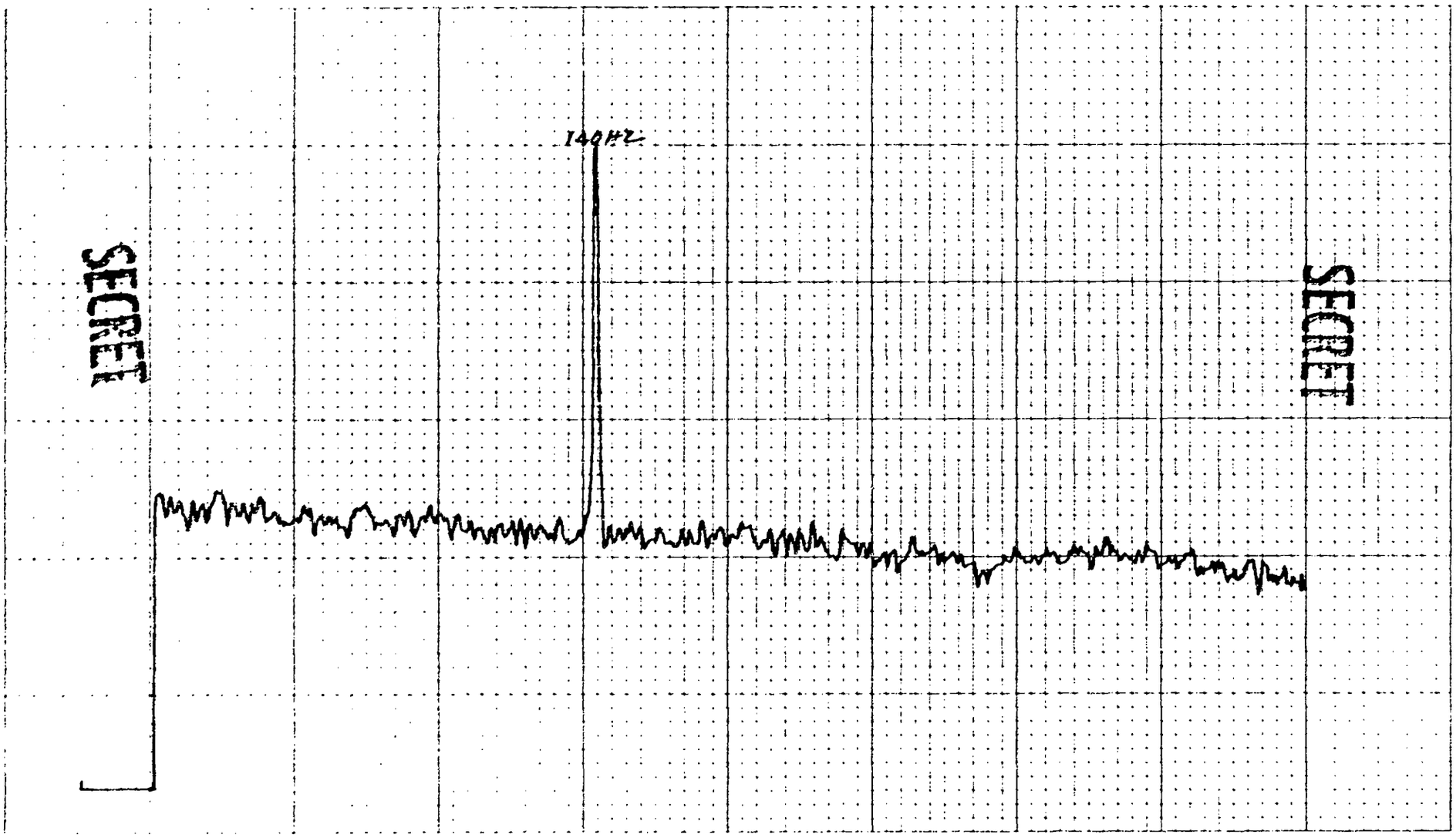
46 0703

CONTROL: 0202 - 30 (DP7)
BEAMFORMED SPECTRUM (ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-40 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

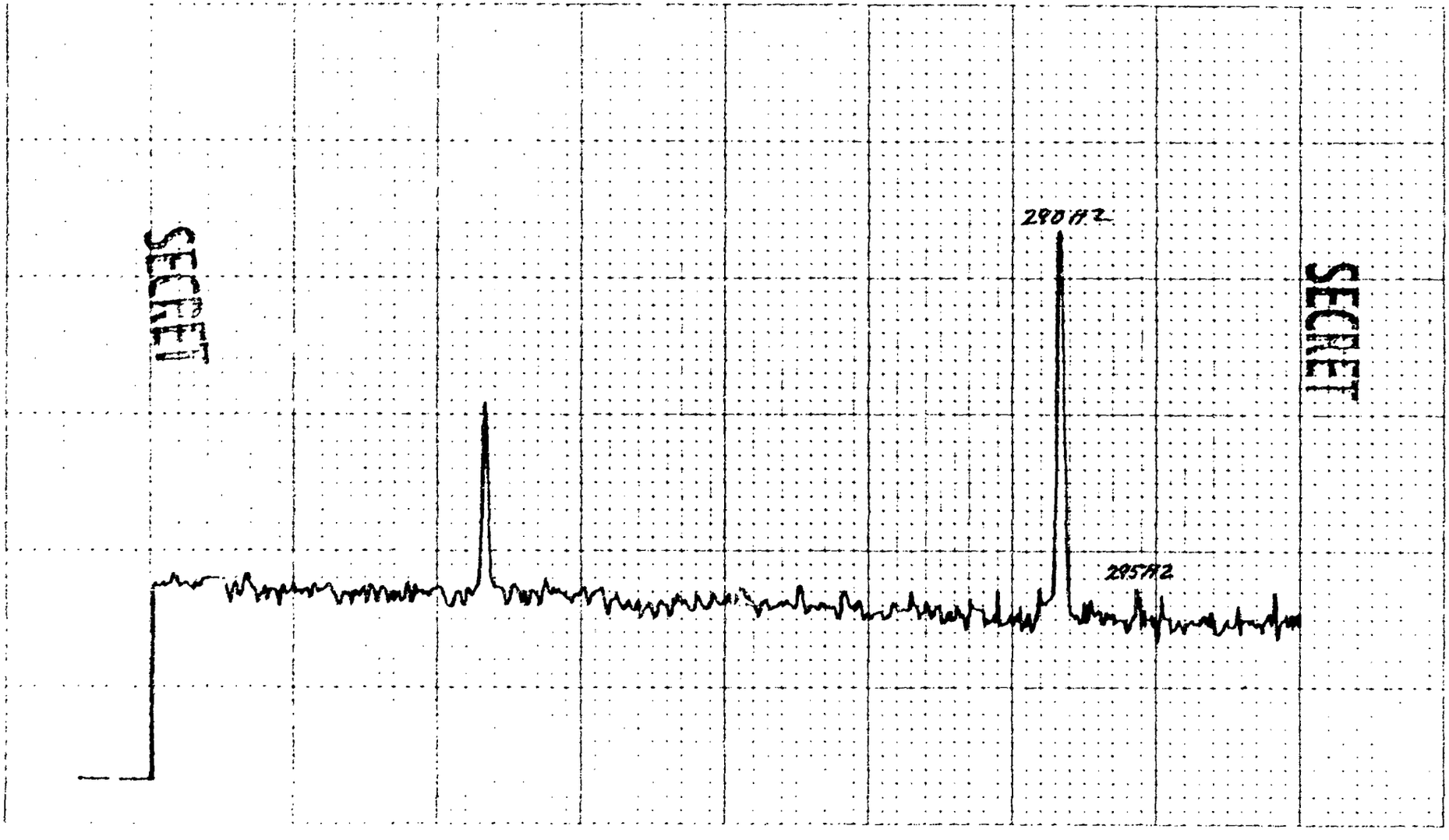


CONTROL: 0202-32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 28-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-12 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

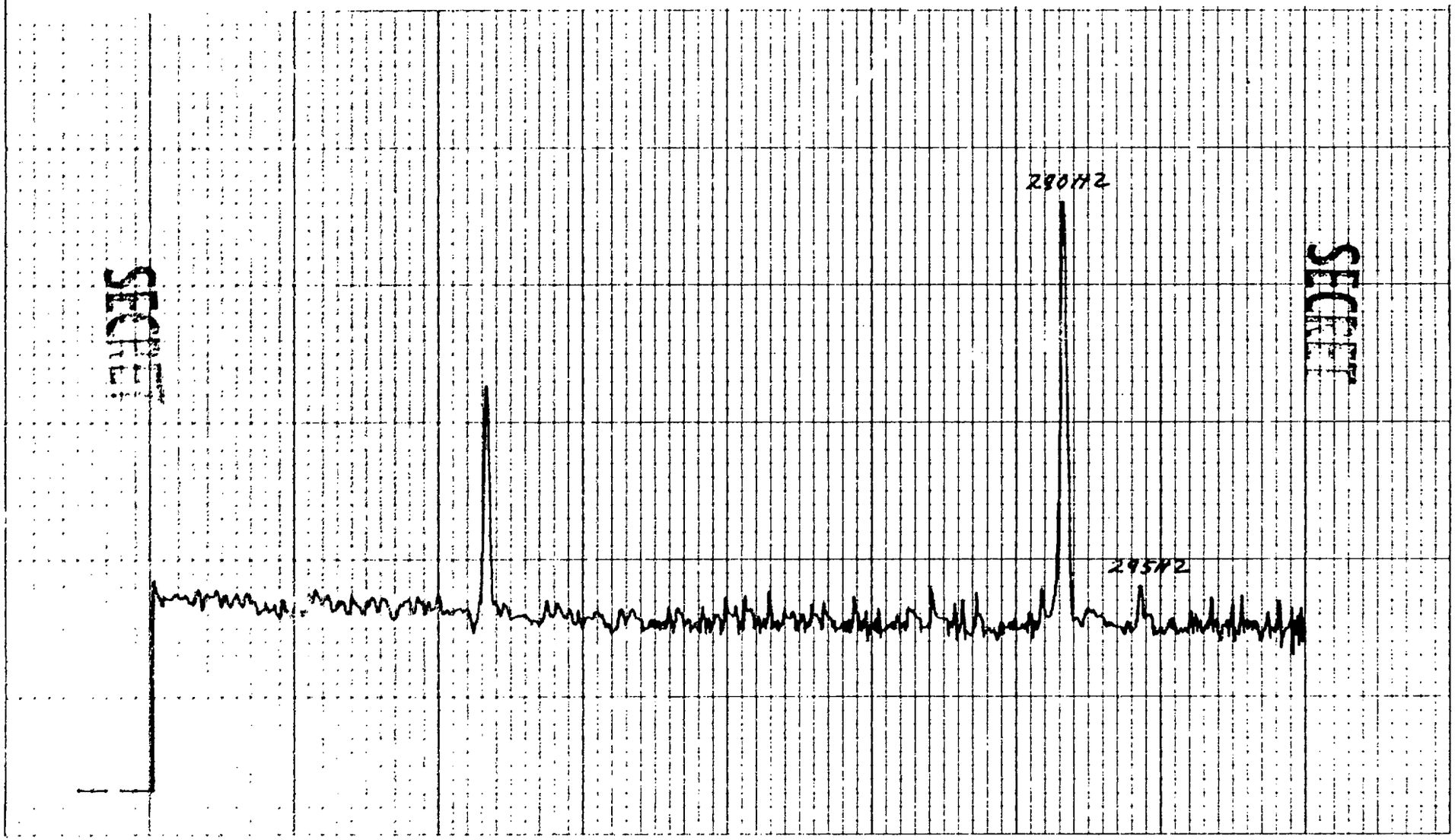


CONTROL: 0202 - 72 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-14 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

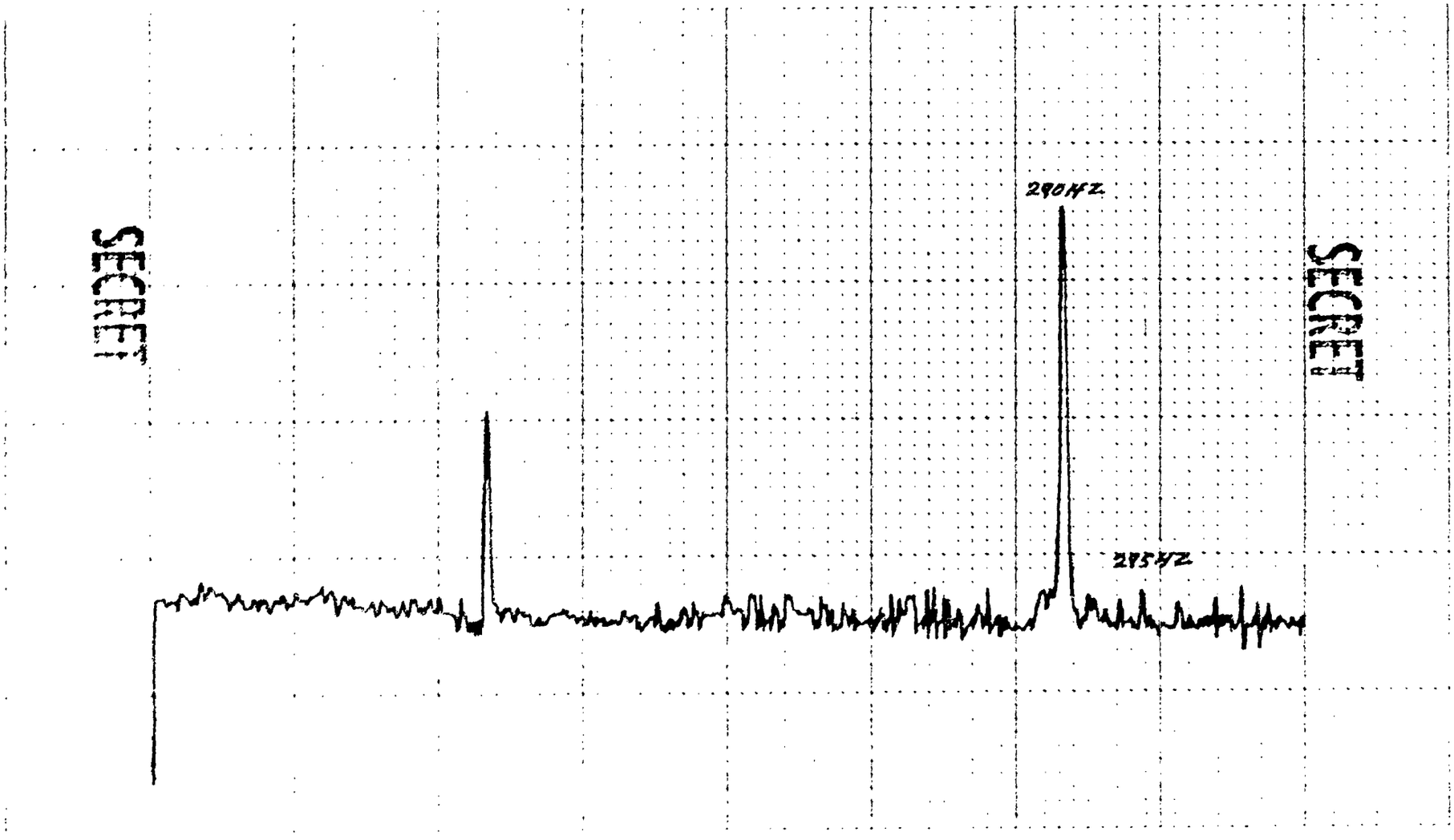


CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-16 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -30 DB

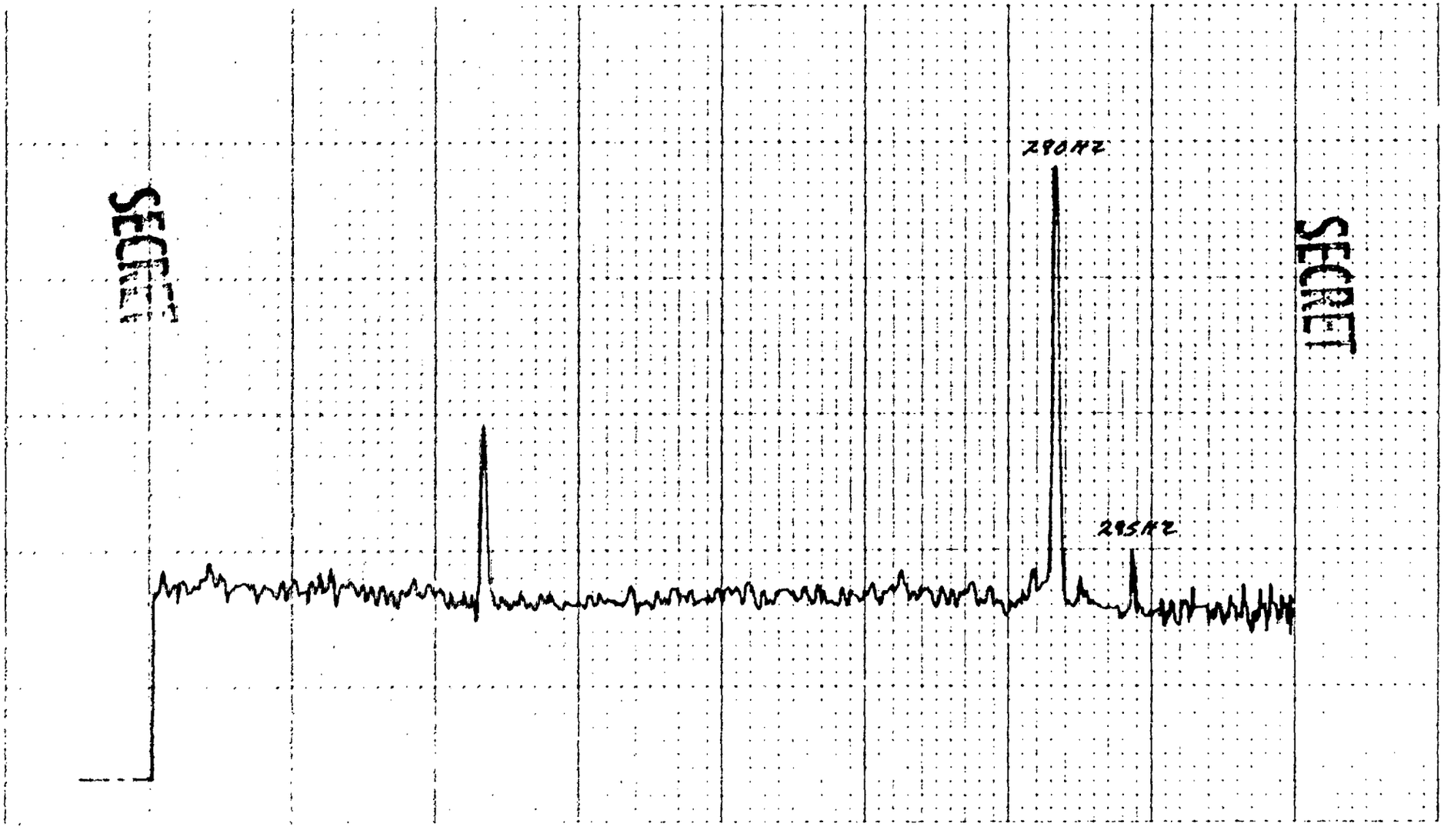


CONTROL: 0202 - 22 (207)
BEAMFORMED SPECTRUM(ELEMENTS 1 - 26 & 29 - 34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-18 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -70DB



46 0703

CONTROL: 0202 - 32 (D.07)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-20 DEG. AZ STEERING

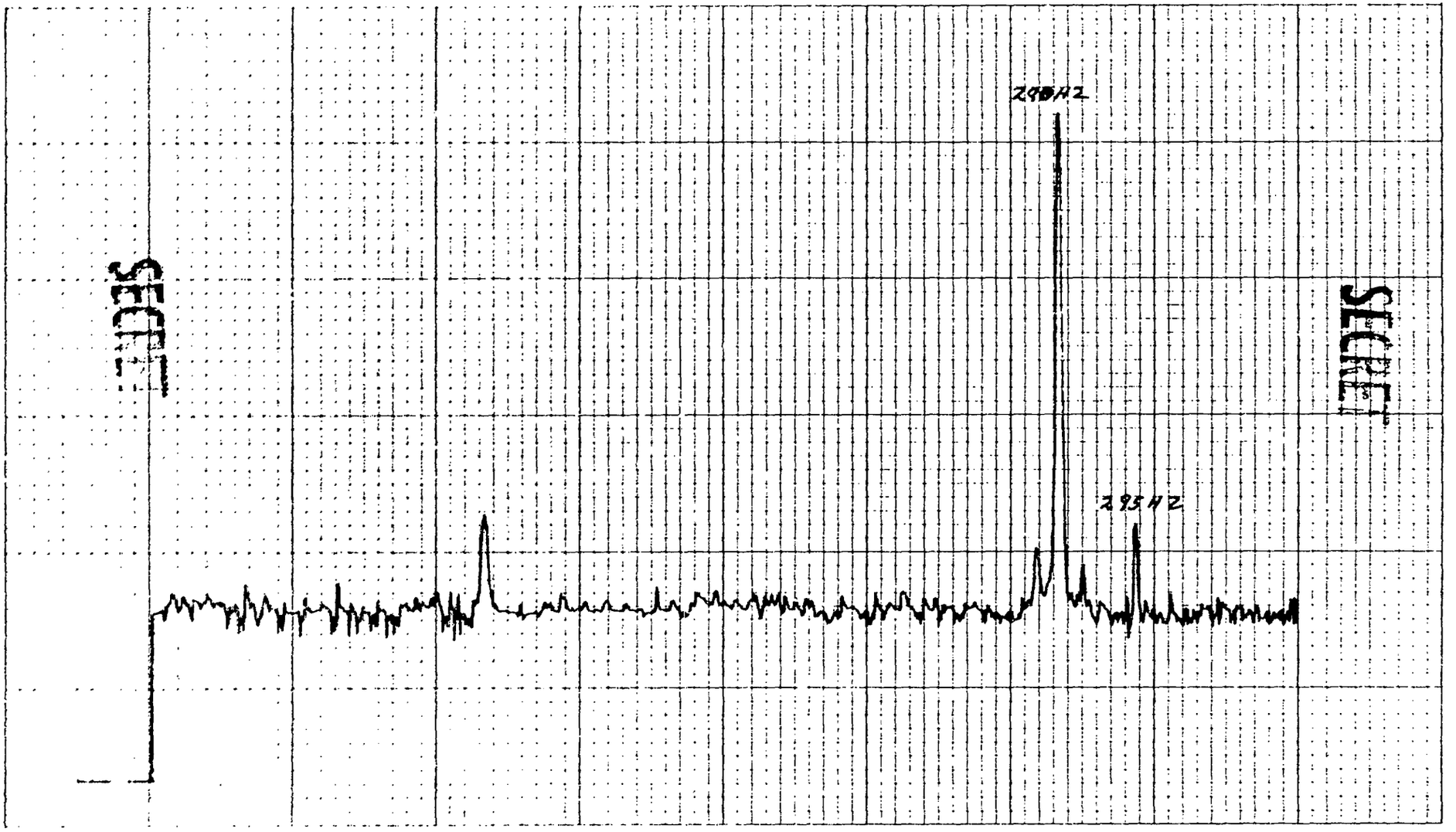
REEL: F29
INDEX 1145
INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING

46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-21.5 DEG. AZ STEERING

REEL: F29
INDEX 1145
INTEGRATION TIME 320 SECS
ATTEN: 30 DB
FILTER WTG: HANNING

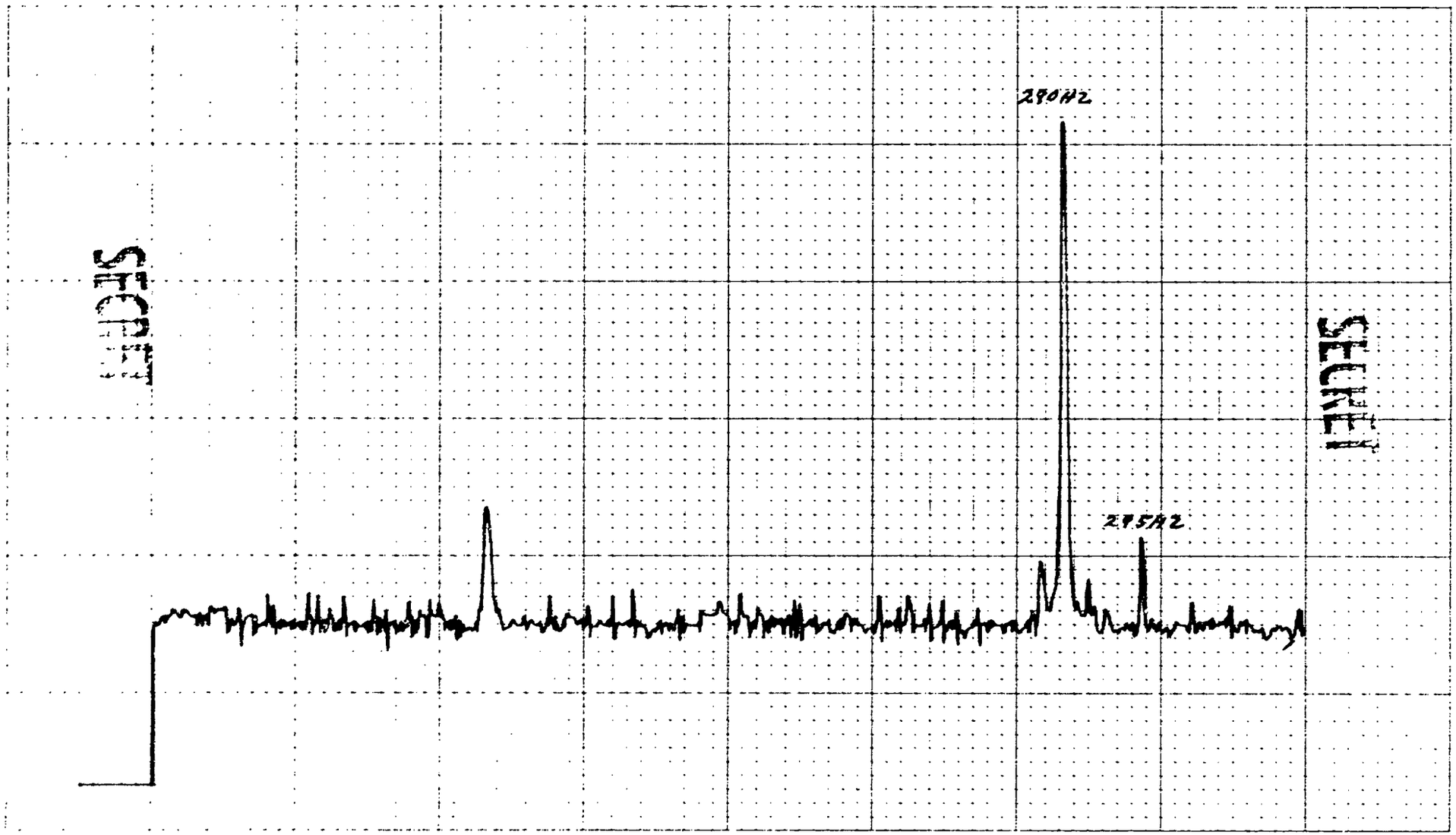


CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-22 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



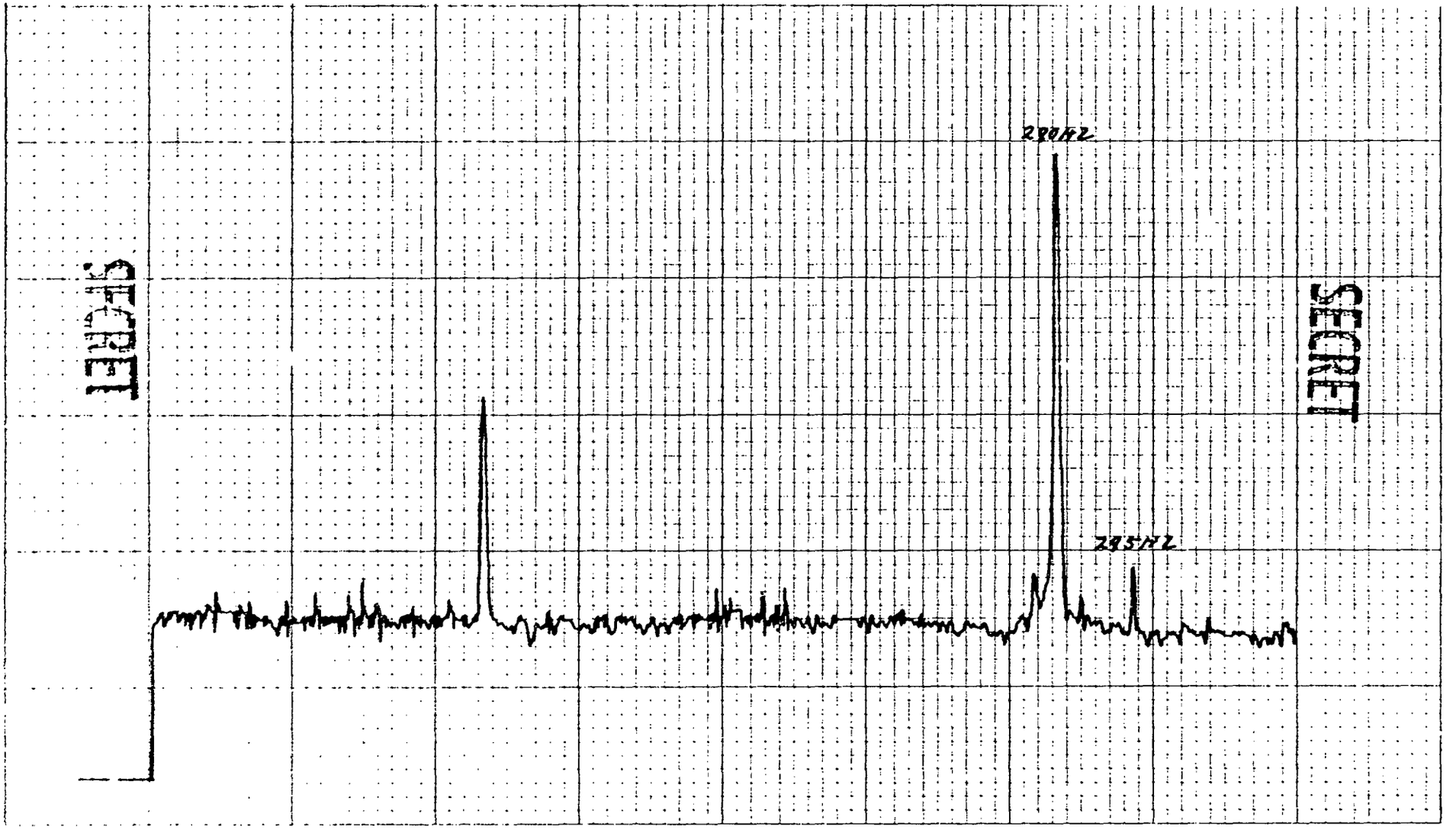
46 0703

CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-24 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



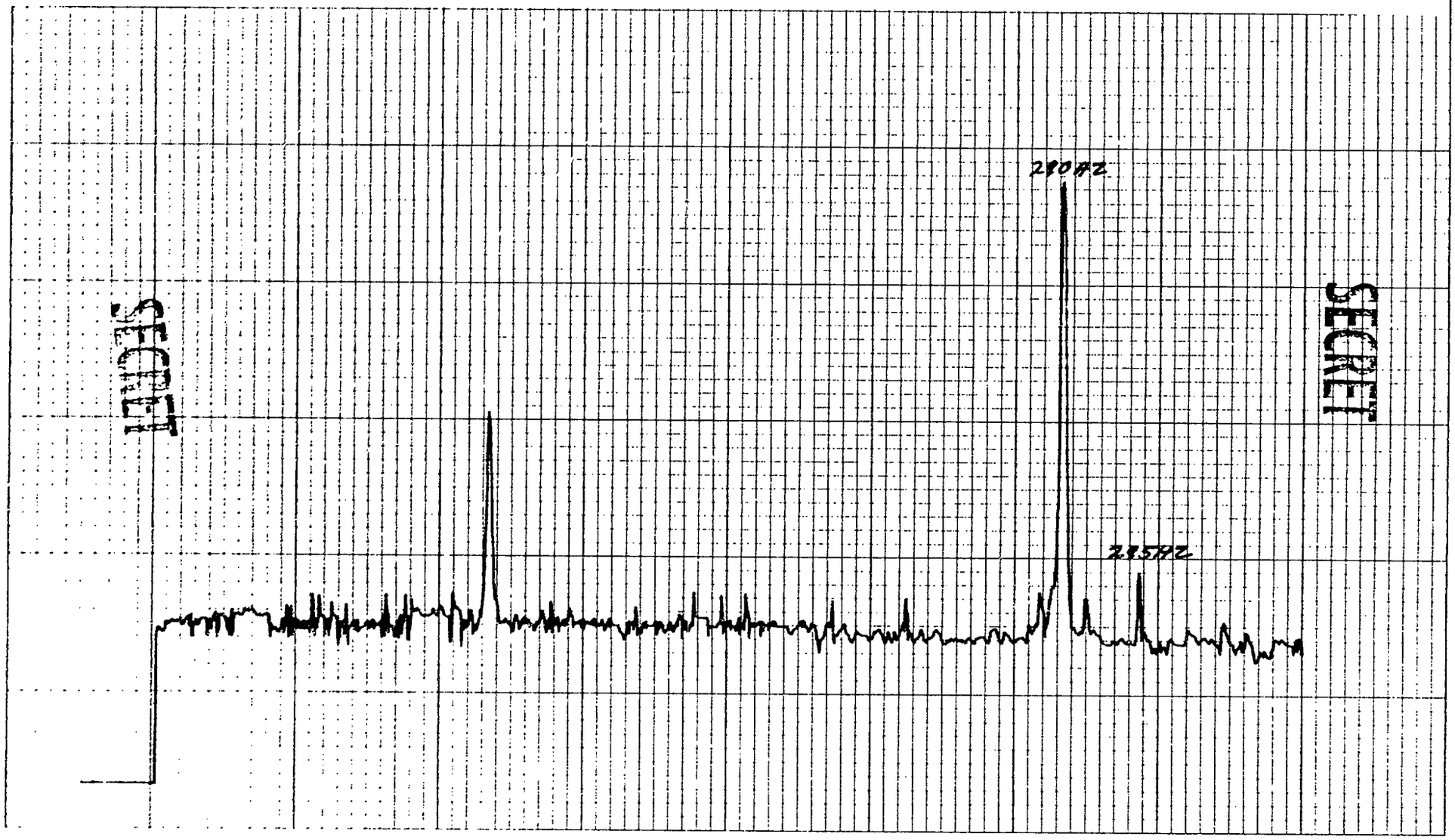
46 0703

CONTROL: 0202 - 32 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-97 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-26 DEG. AZ STEERING

REEL: F09
INDEX 1145

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING
ATTEN: -30 DB



46 0703

CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 28-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-28 DEG. AZ STEERING

REEL: F29
INDEX 1145

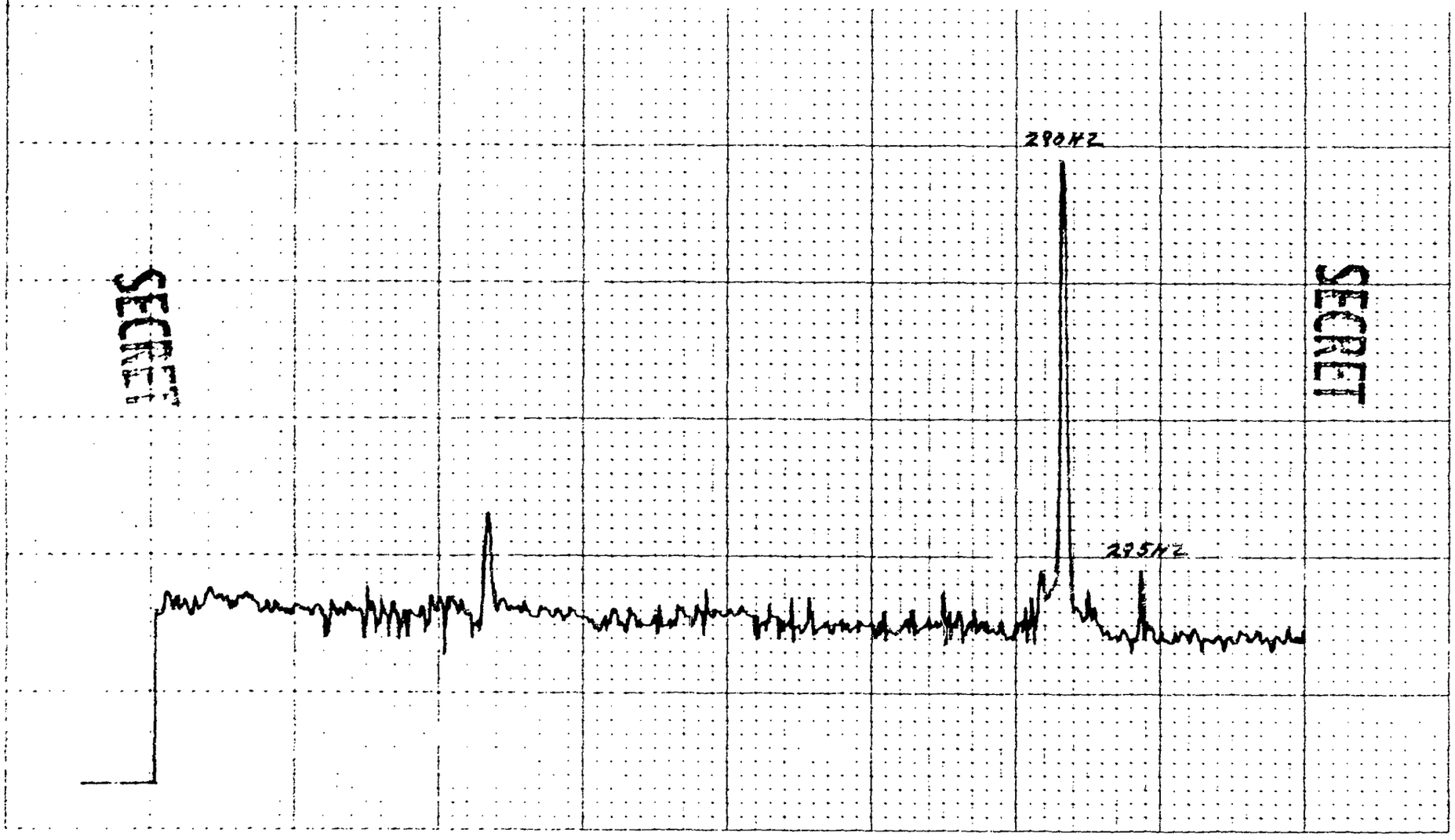
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING
ATTEN: -30 DB

CONTROL: 0202-32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
+30 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

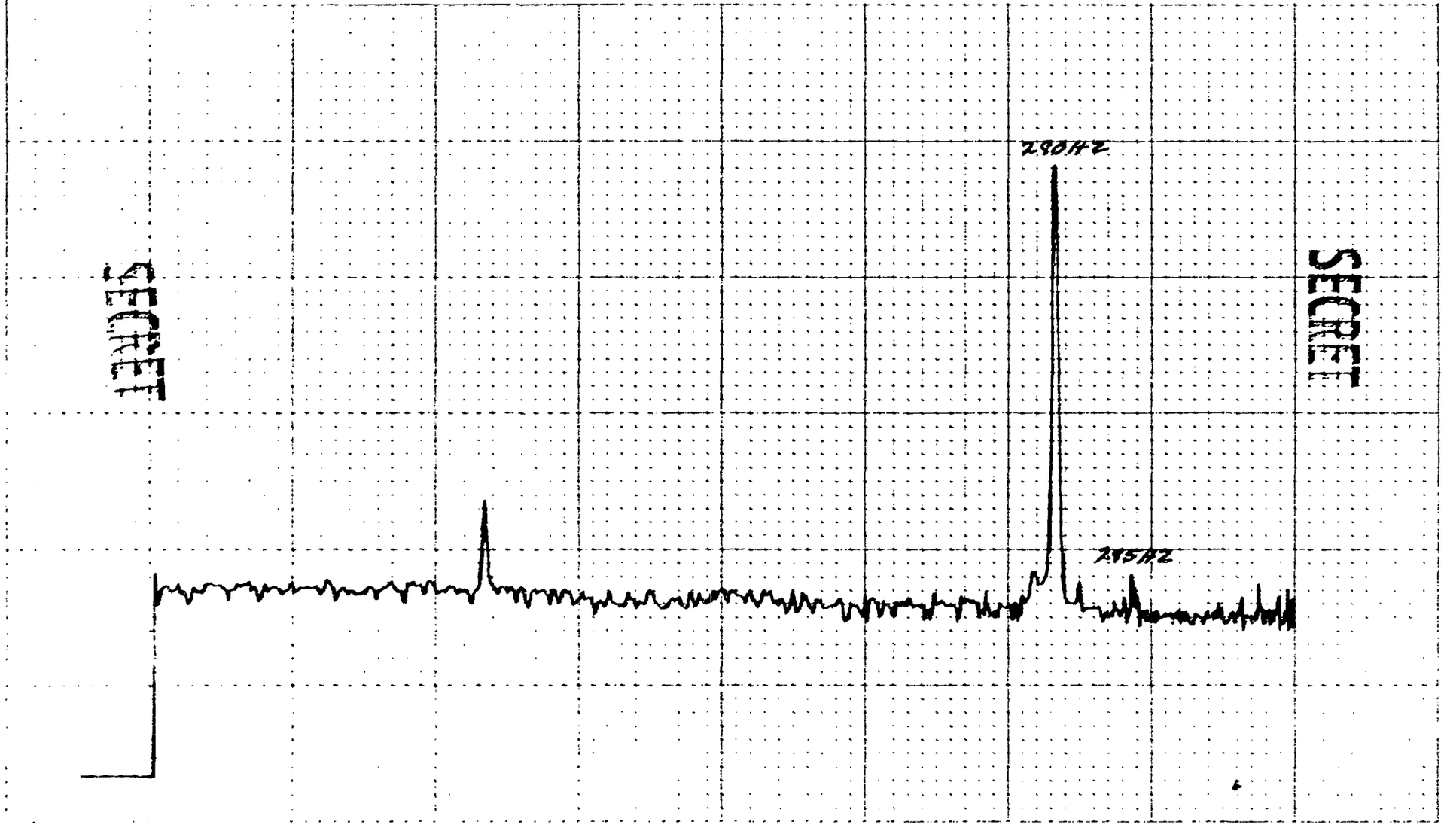


CONTROL: 0202-32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-32 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -30DB



46 0703

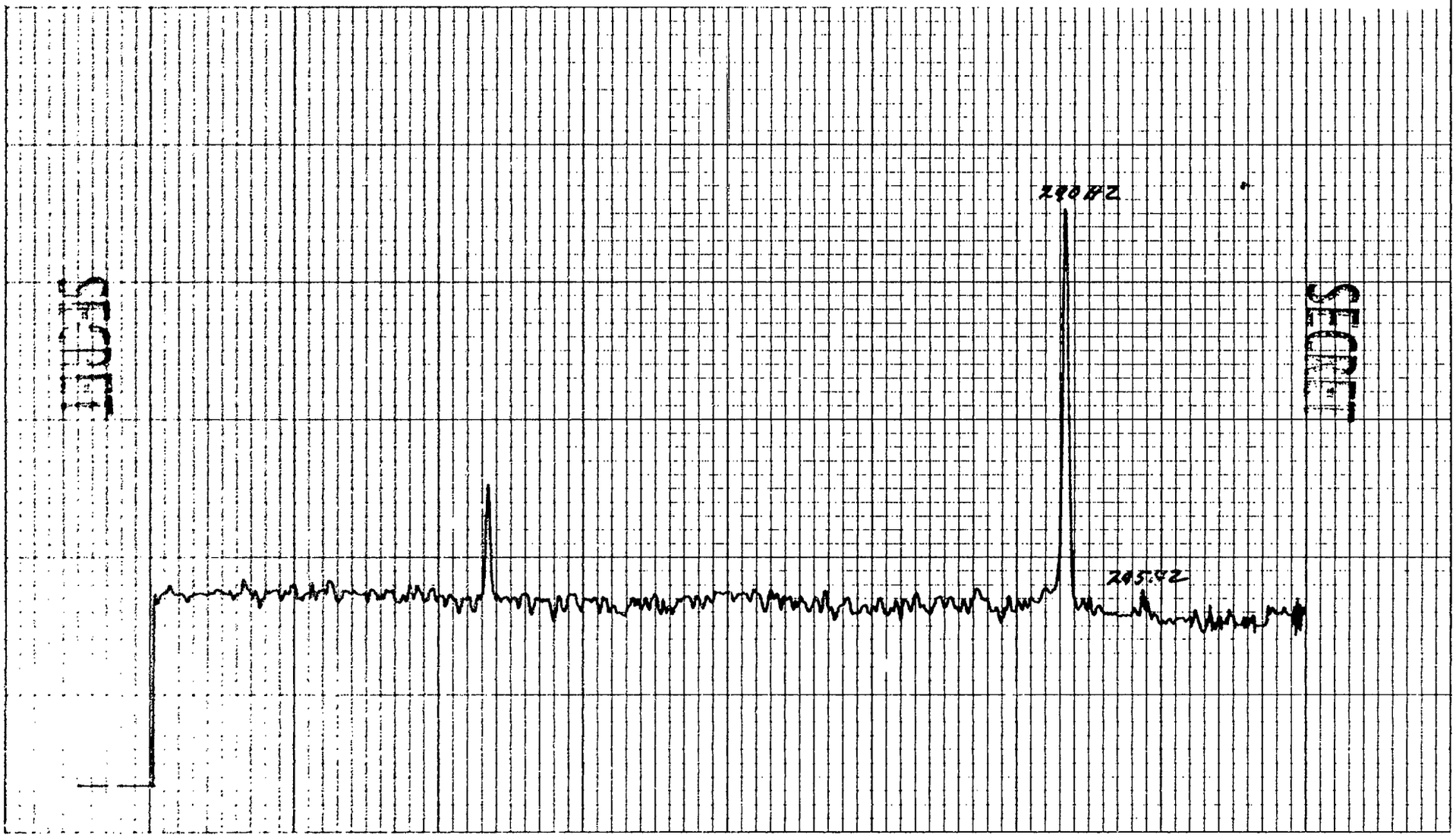
CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-33 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
FILTER

ATTEN: -30 DB
WTG: HANNING



46 0703

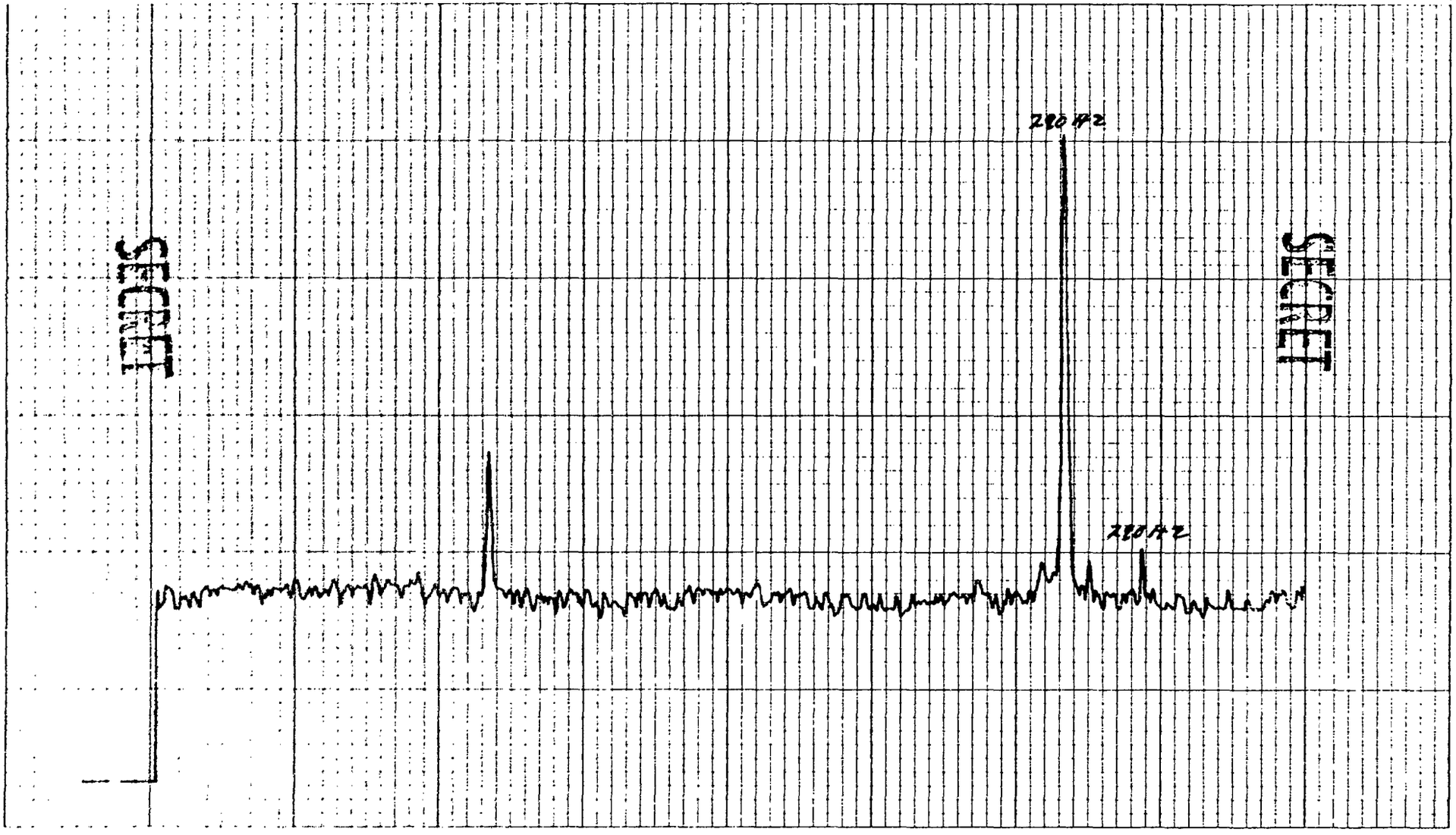
CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-34 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
FILTER

ATTEN: -30 DB
WTG: HANNING

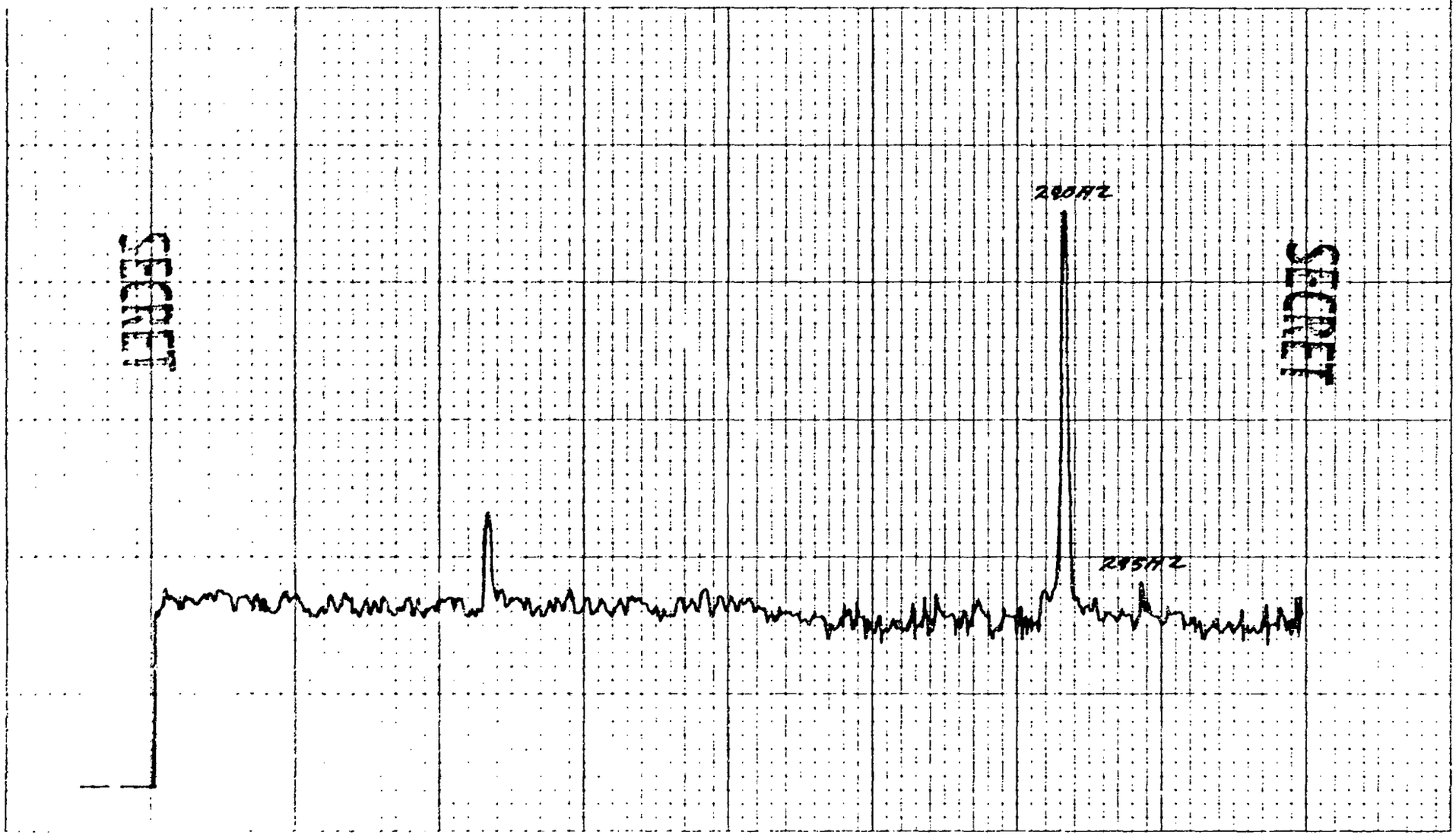


CONTROL: 0202 - 32 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
72 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-36 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

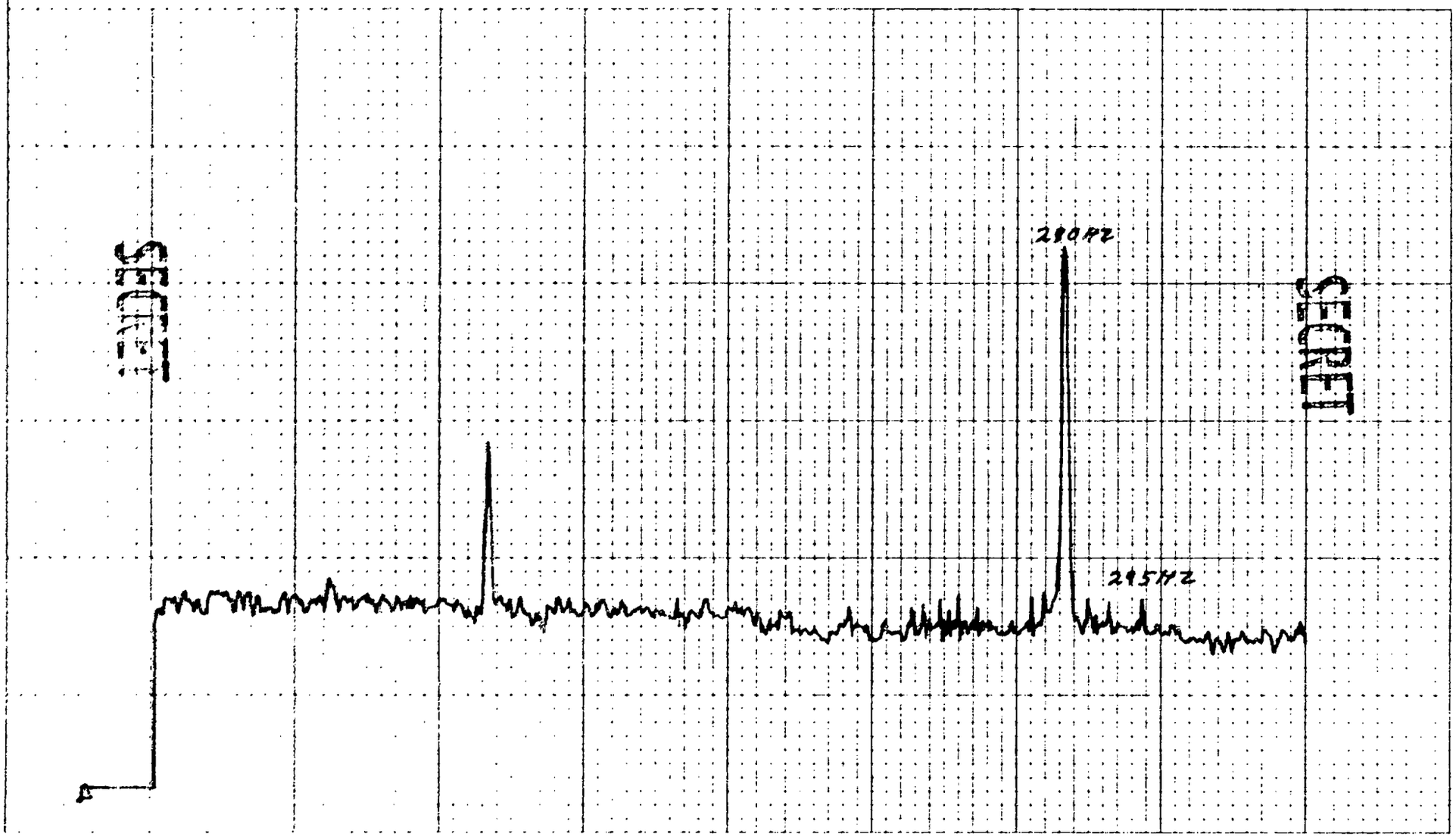


CONTROL: 0202 - 32 (D87)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-38 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -30 DB



CONTROL: 0202 - 32 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-40 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -20 DB

		-16.2	
	-25.5	41.7	
	-4.6	37.7	
	+ .2	37.9	SNR 1/10 HZ BAND
	-8.2	29.7	SNR 1 HZ BAND

CO[illegible]

SIGNAL LEVEL AND SNR

CALCULATIONS

FREQUENCY 290 HZ

NUMBER OF ELEMENTS 51

DATA POINT 7

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-28.8	
MCPS-32 CAL. CORRECTION	+10	-18.8	
BEAMFORMER GAIN	+30	+11.2	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	+12.0	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-71.6	
MCPS-32 CAL. CORRECTION	+10	-61.6	
BEAMFORMER GAIN	+30	-31.6	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+11.2	
SIGNAL LEVEL FOR SNR	-31.6	+2.8	
PROCESSOR CORRECTION	-4.0	38.8	
MRA CORRECTION	+ .8	39.6	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	31.4	SNR 1 HZ BAND

CO[illegible]

SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 7 FREQUENCY 295 HZ NUMBER OF ELEMENTS 51

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-65.0	
MCPS-32 CAL. CORRECTION	+10	-55.0	
BEAMFORMER GAIN	-30	-25.0	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	-24.2	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-72.3	
MCPS-32 CAL. CORRECTION	+10	-62.3	
BEAMFORMER GAIN	+30	-32.3	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-25.0	
SIGNAL LEVEL FOR SNR	-32.3	7.3	
PROCESSOR CORRECTION	- 4.8	2.5	
MRA CORRECTION	+ .8	3.3	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	-4.9	SNR 1 HZ BAND

DATA POINT 7

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-16.0	-17.5	
MRA SIGNAL LEVEL	+16.4	+12.0	-24.2
ARRAY SIGNAL GAIN	32.4	29.5	
20 LOG 51 (# of elements)	34.1	34.1	
DIFFERENCE	-1.7	-4.6	

ARRAY GAIN

MRA SNR	37.9	39.6	3.3
MEAN OMNI SNR	29.4	32.5	
ARRAY GAIN	8.5	7.1	
THEORETICAL AZMUTH GAIN (at MRA)	14.7	17.1	17.2
DIFFERENCE	-6.2	-10.0	

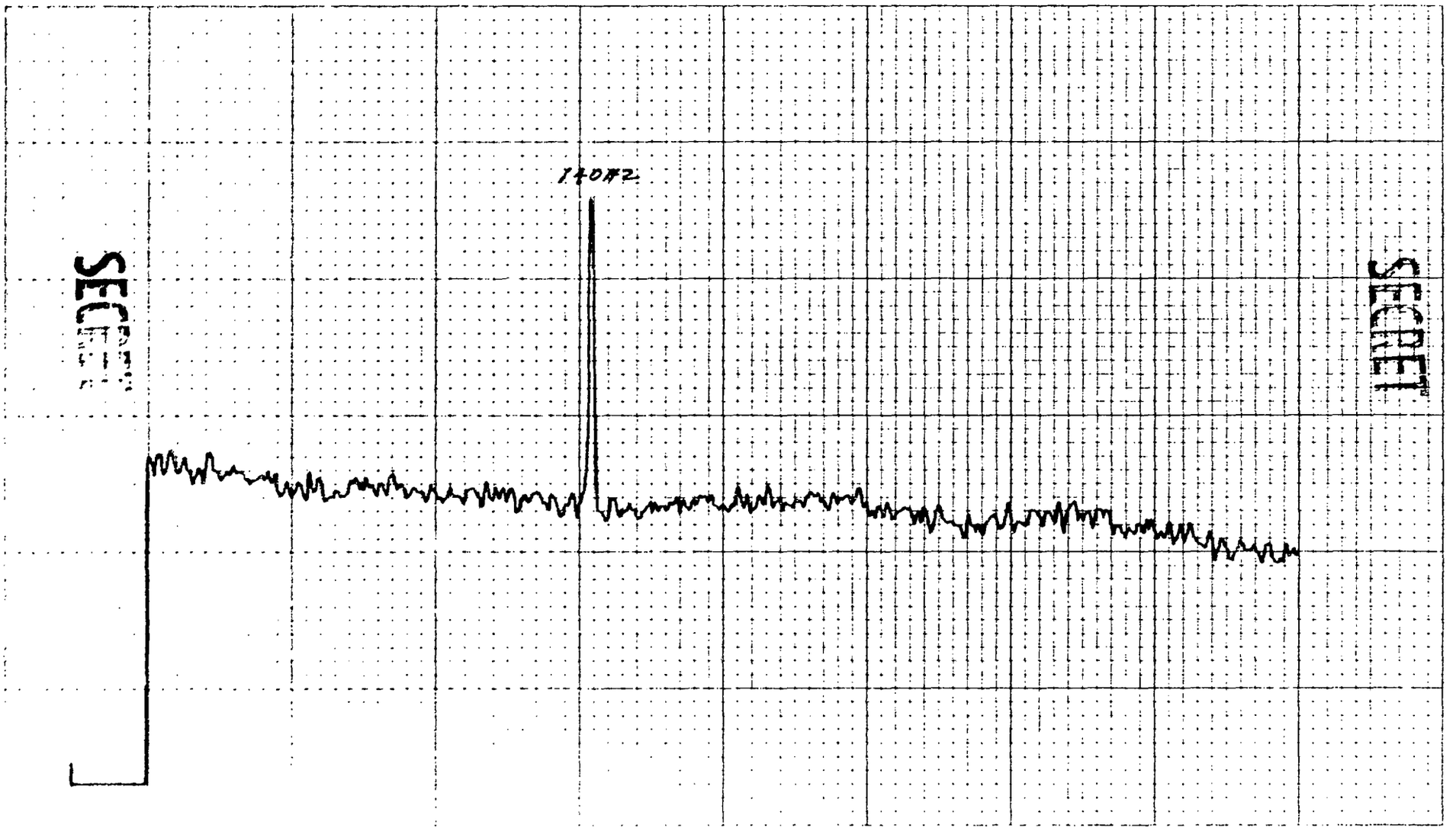
K+E 10 X 10 TO THE INCH 46 0703

CONTROL: 0202-51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-12 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

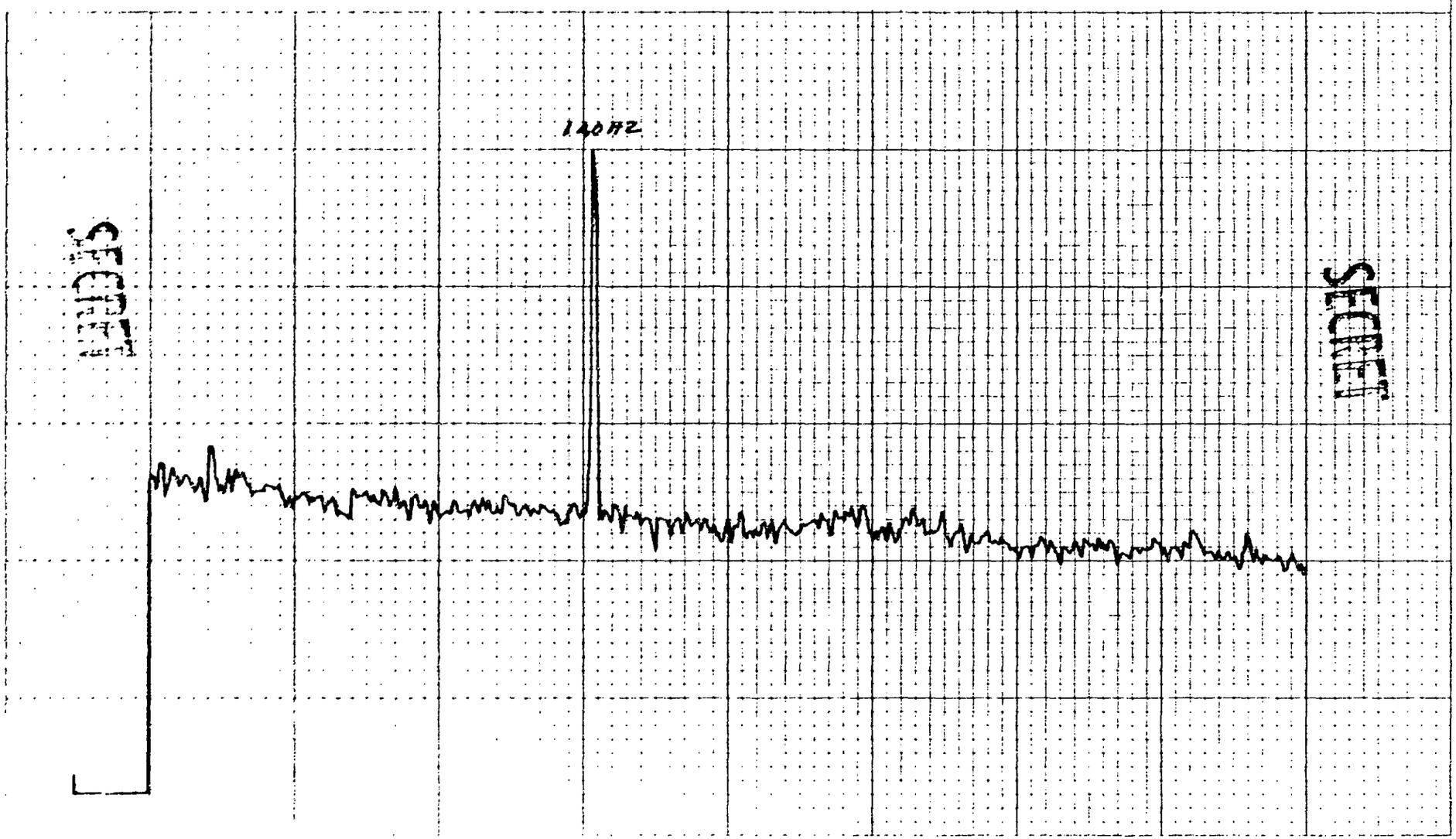


CONTROL: 0202-51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-14 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

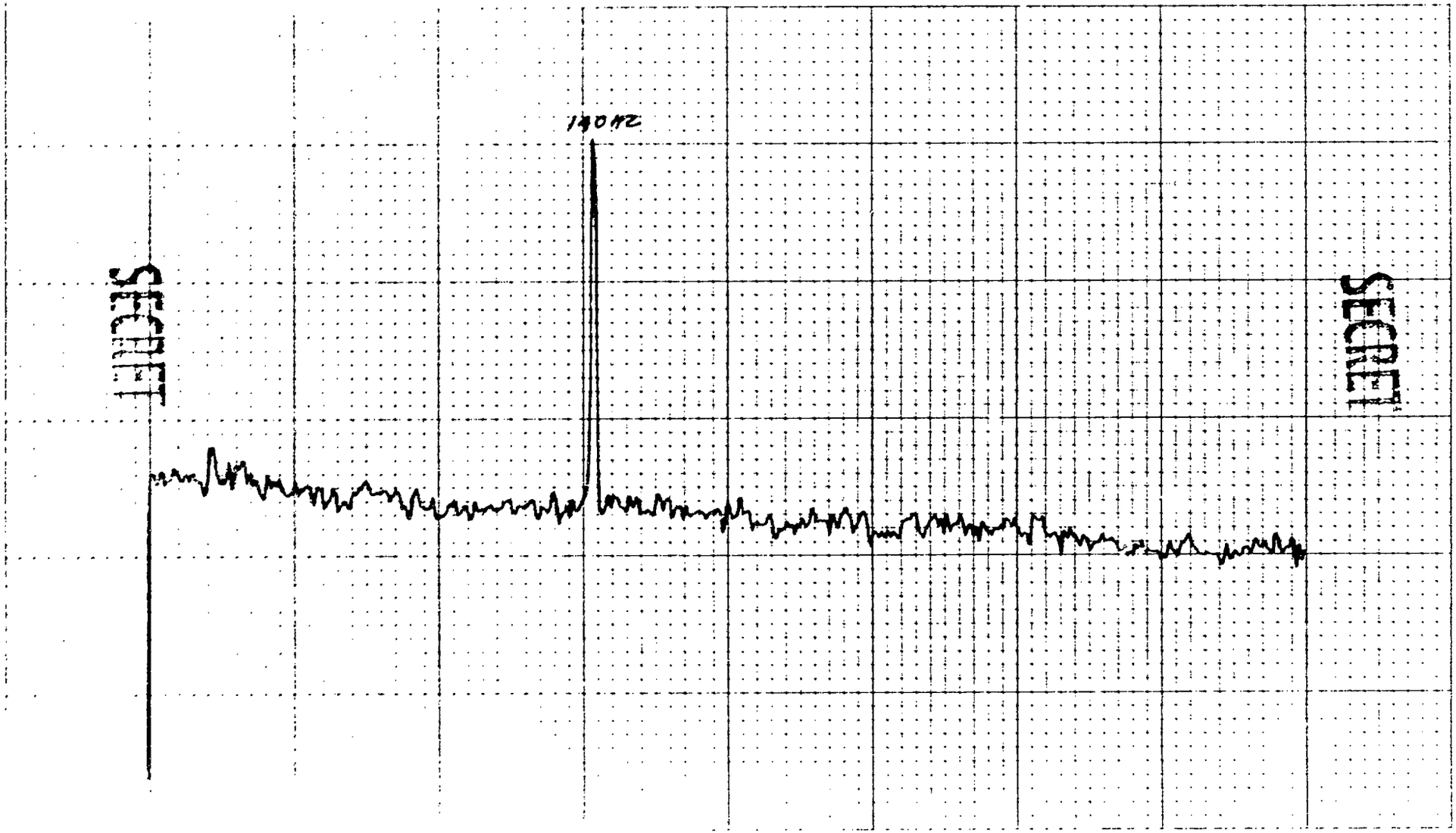


CONTROL: 0202-51 (DIT)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 28-53)
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-16 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

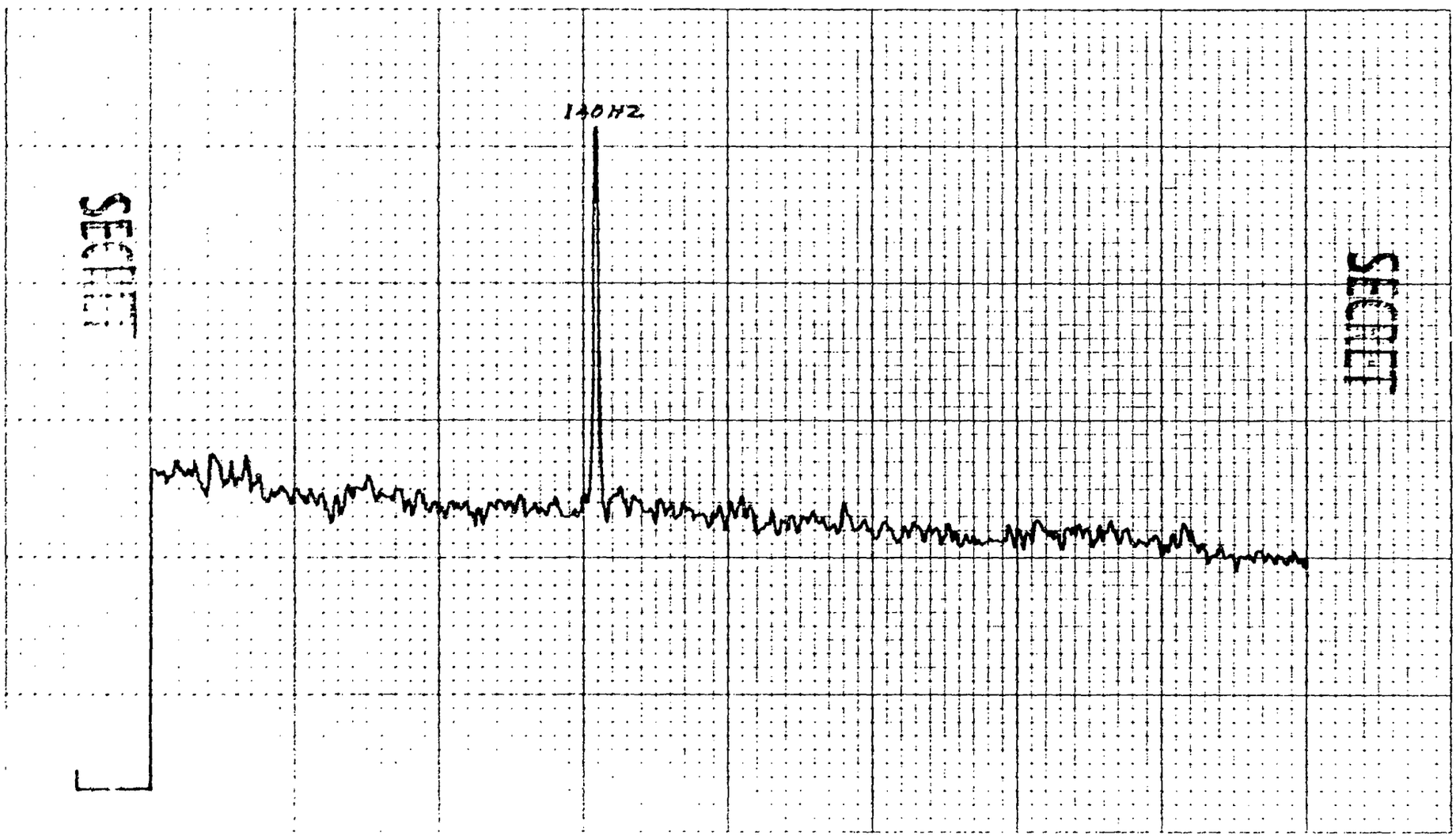


CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 - #29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-18 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
FILTER
ATTEN: -30 DB
WTG: HANNING

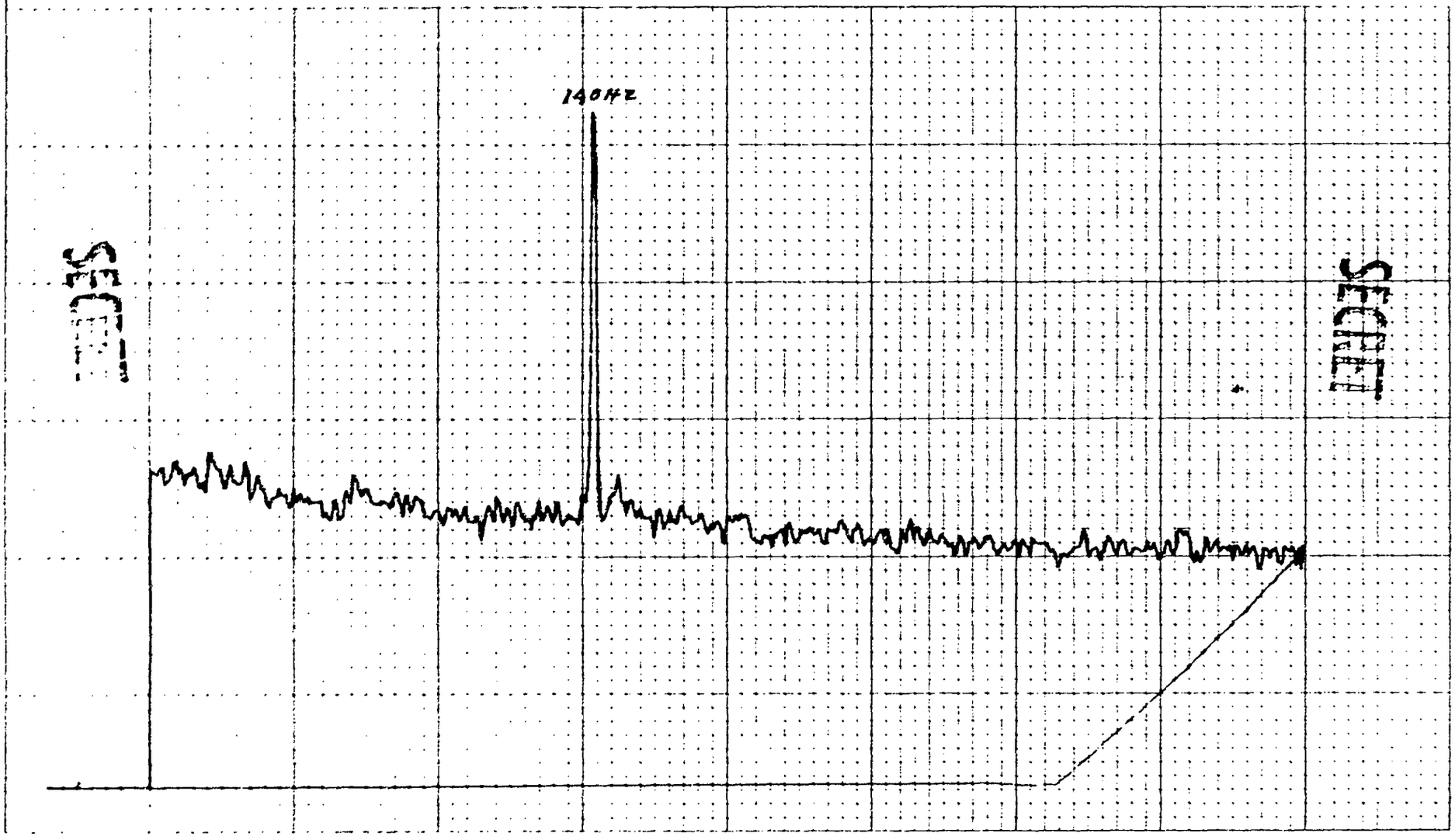


CONTROL: 0202 - 51 (D97)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 28-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-20 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING

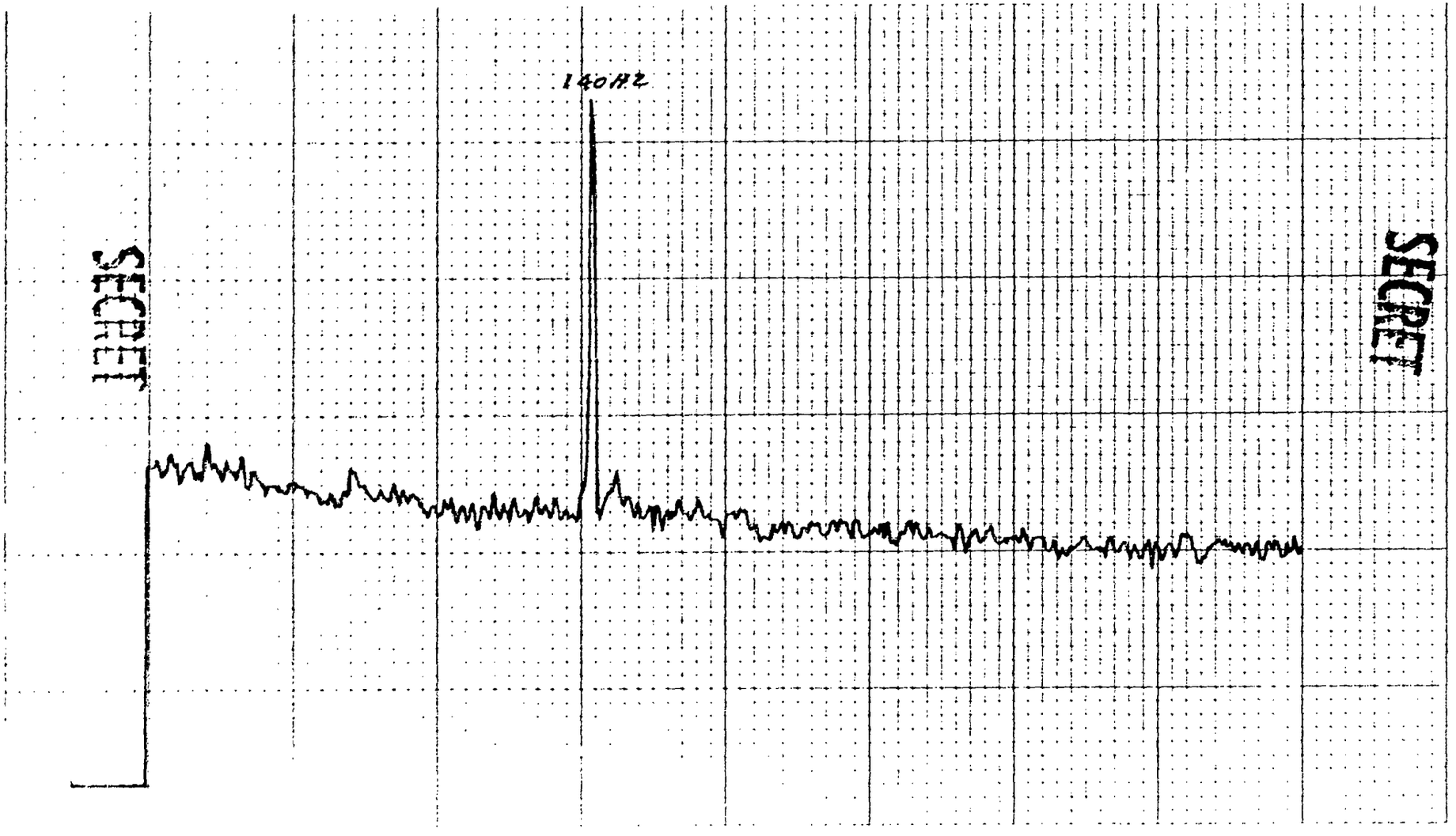


CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-21 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30DB
WTG: HANNING



K+E 10 X 10 TO THE INCH 10 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

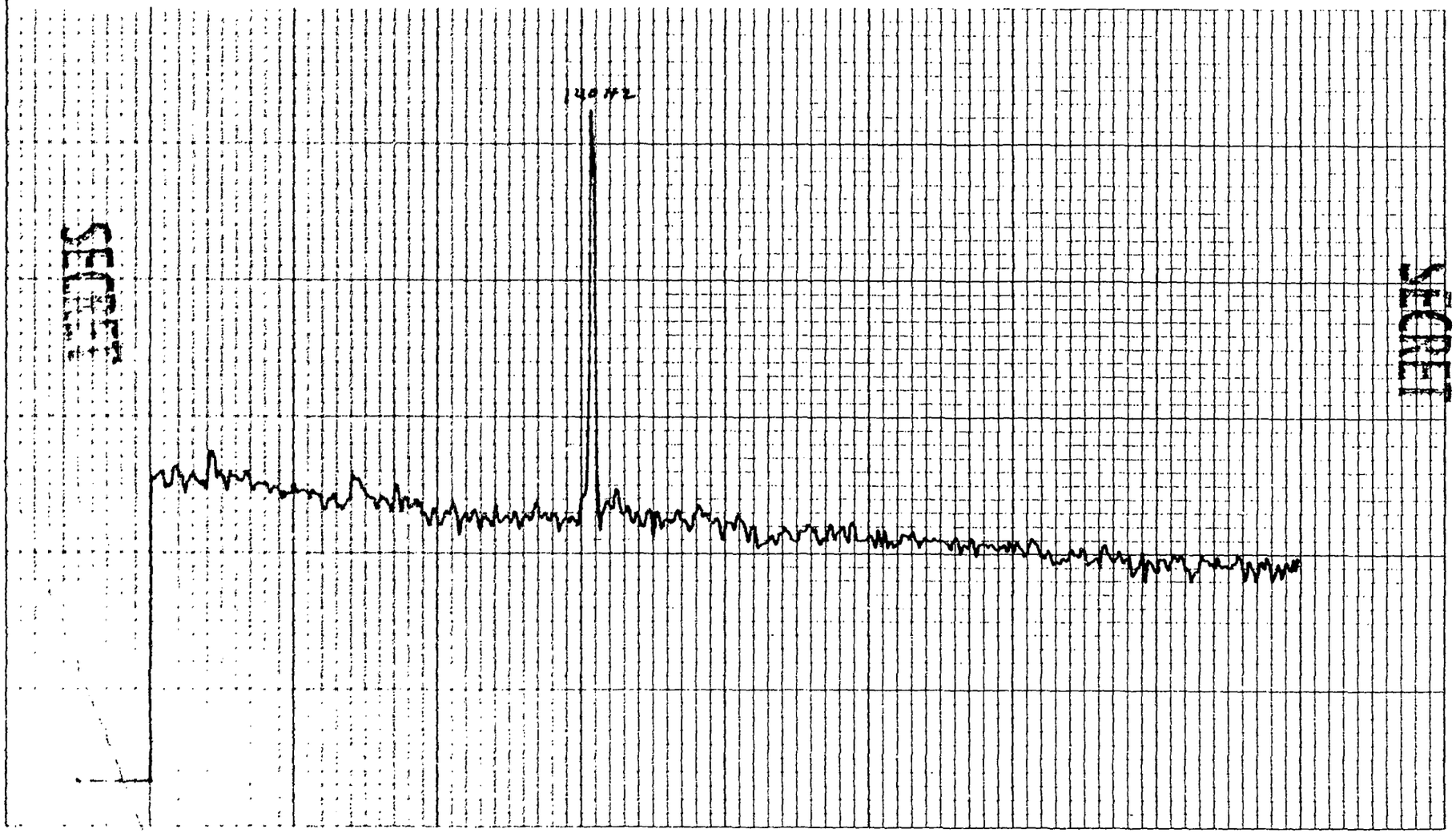
46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
- 22 DEG. AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: -30 DB
FILTER WTG: HANNING

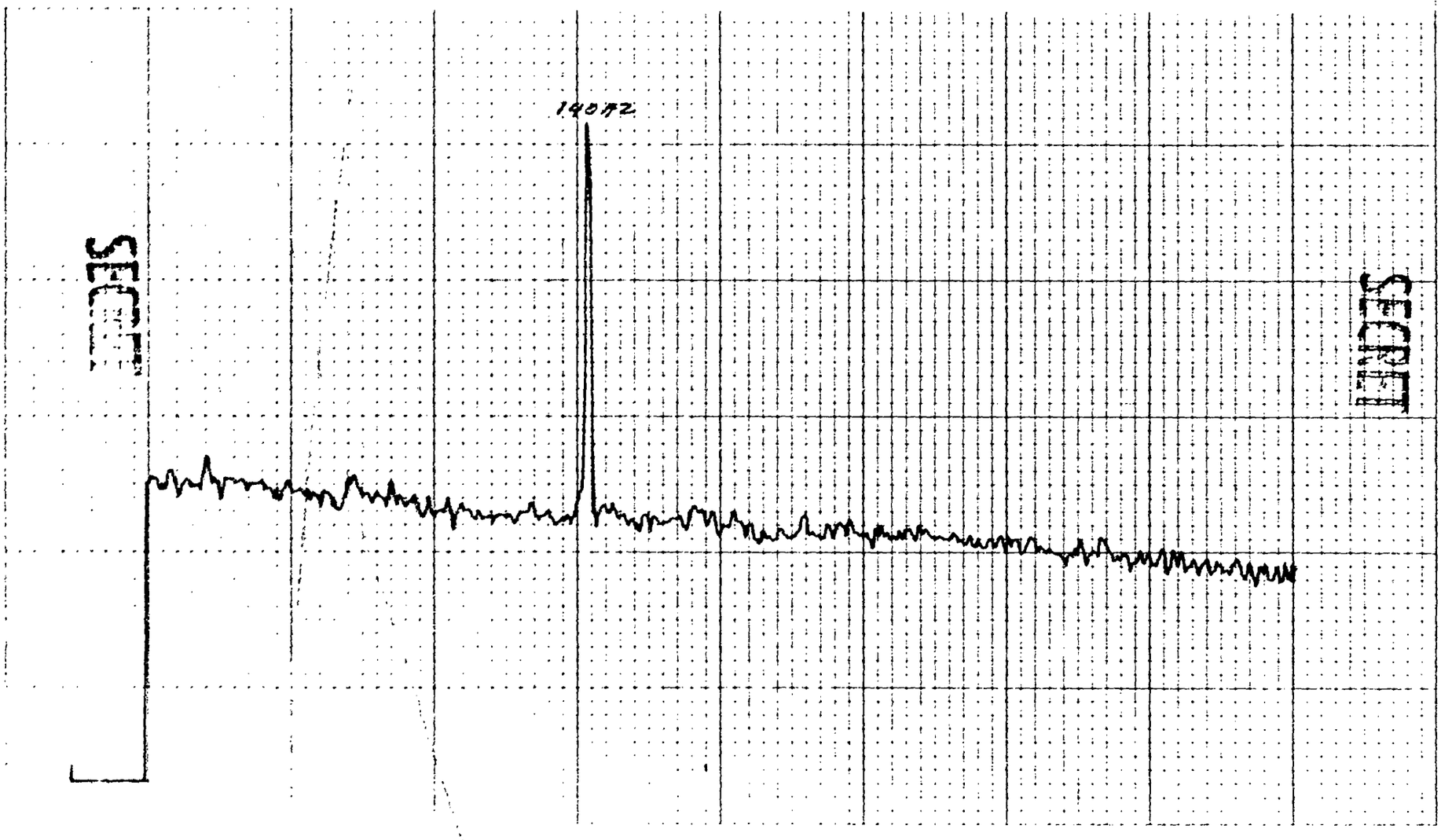


CONTROL: 0202- 51 (DIT)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-23 DEG. AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: -30 DB
FILTER WTG: HANNING



K•E

46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

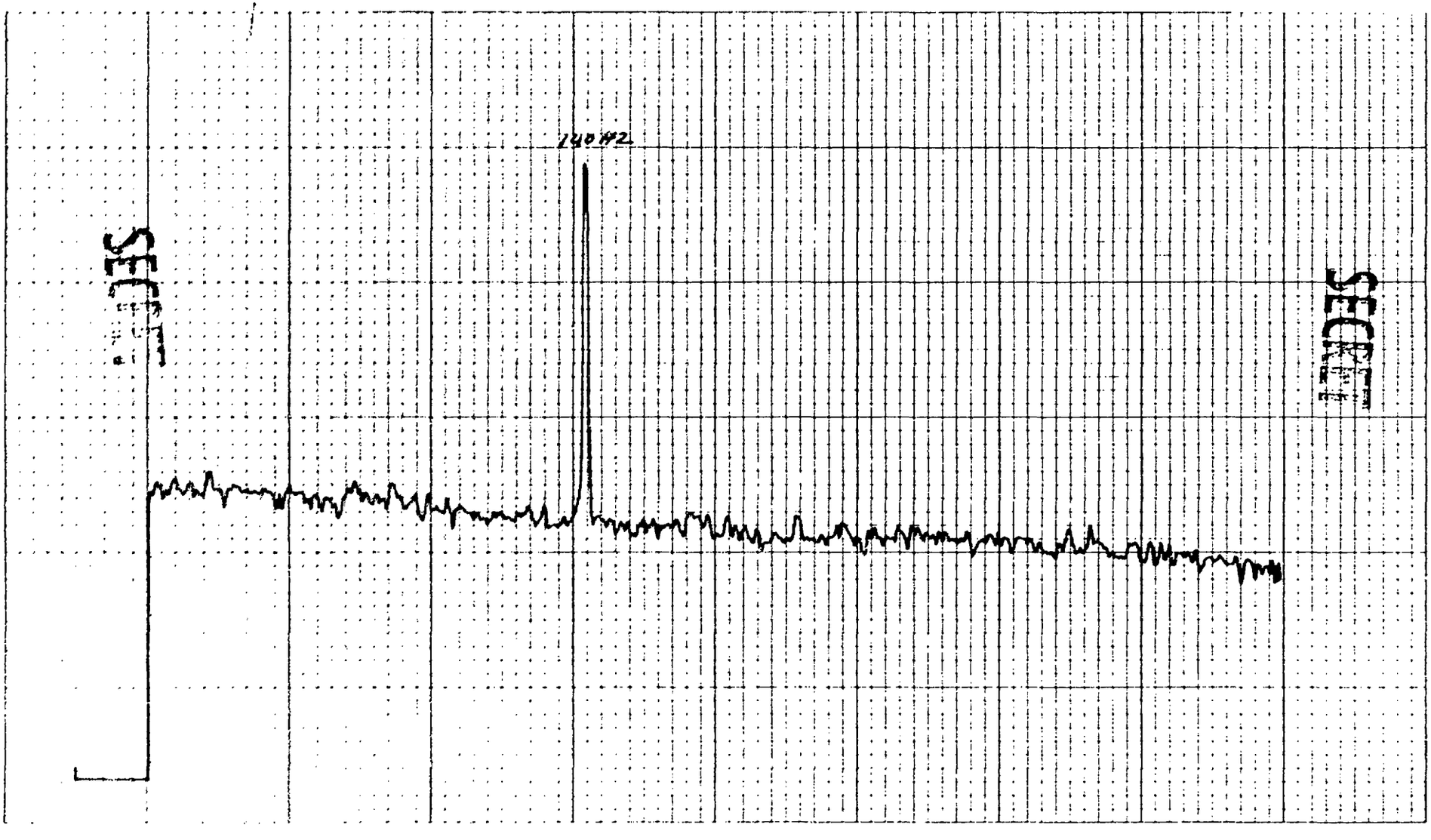
DATE OF ANALYSIS: — — —
DATE/TIME: 8-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-24 DEG. AZ STEERING

REEL: F29

INTEGRATION TIME 320 SECS

INDEX 1145

ATTEN: -30 DB
FILTER WTG: HANNING

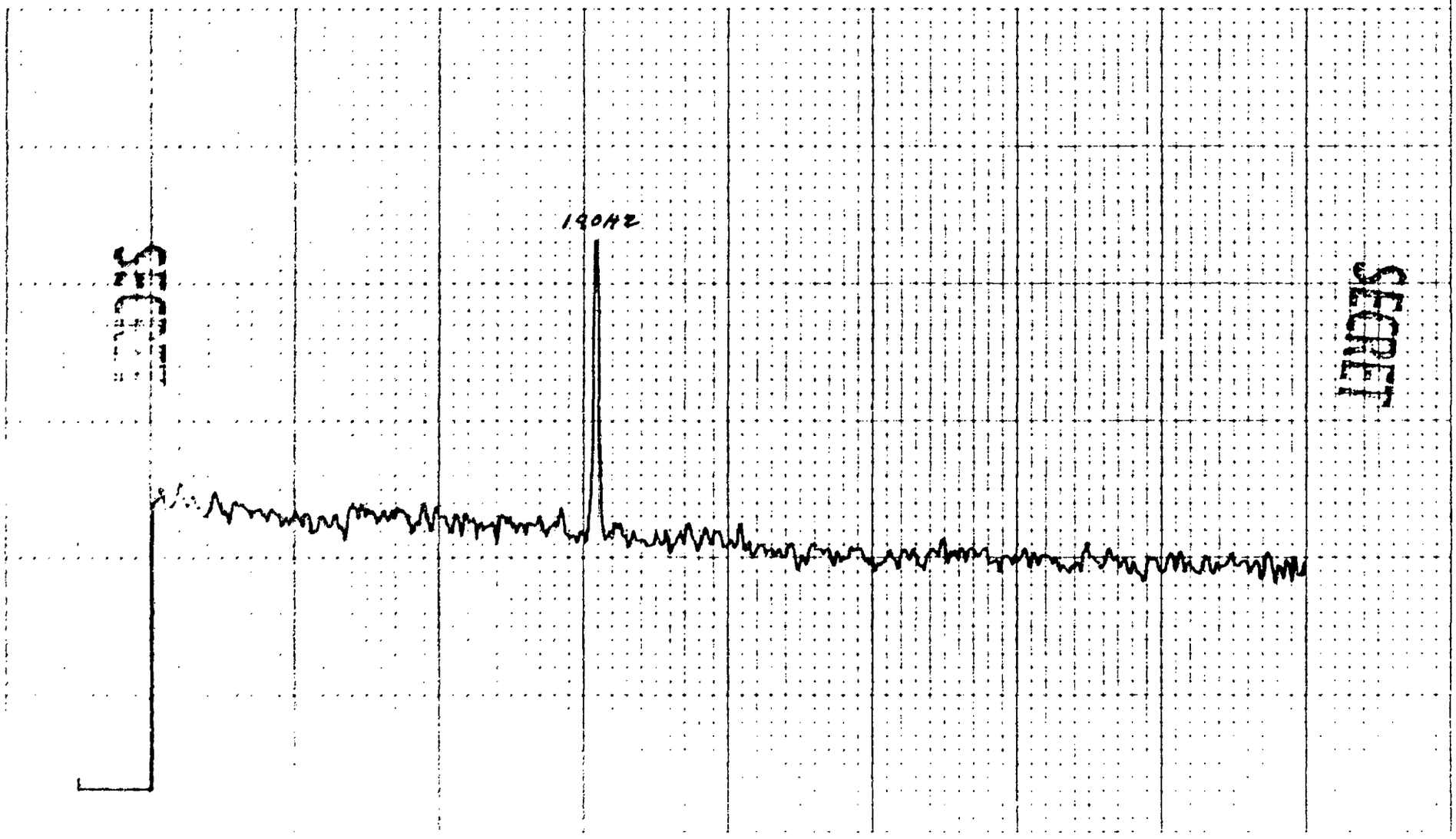


CONTROL: 020 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-33)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-26 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30DB
WTG: HANNING

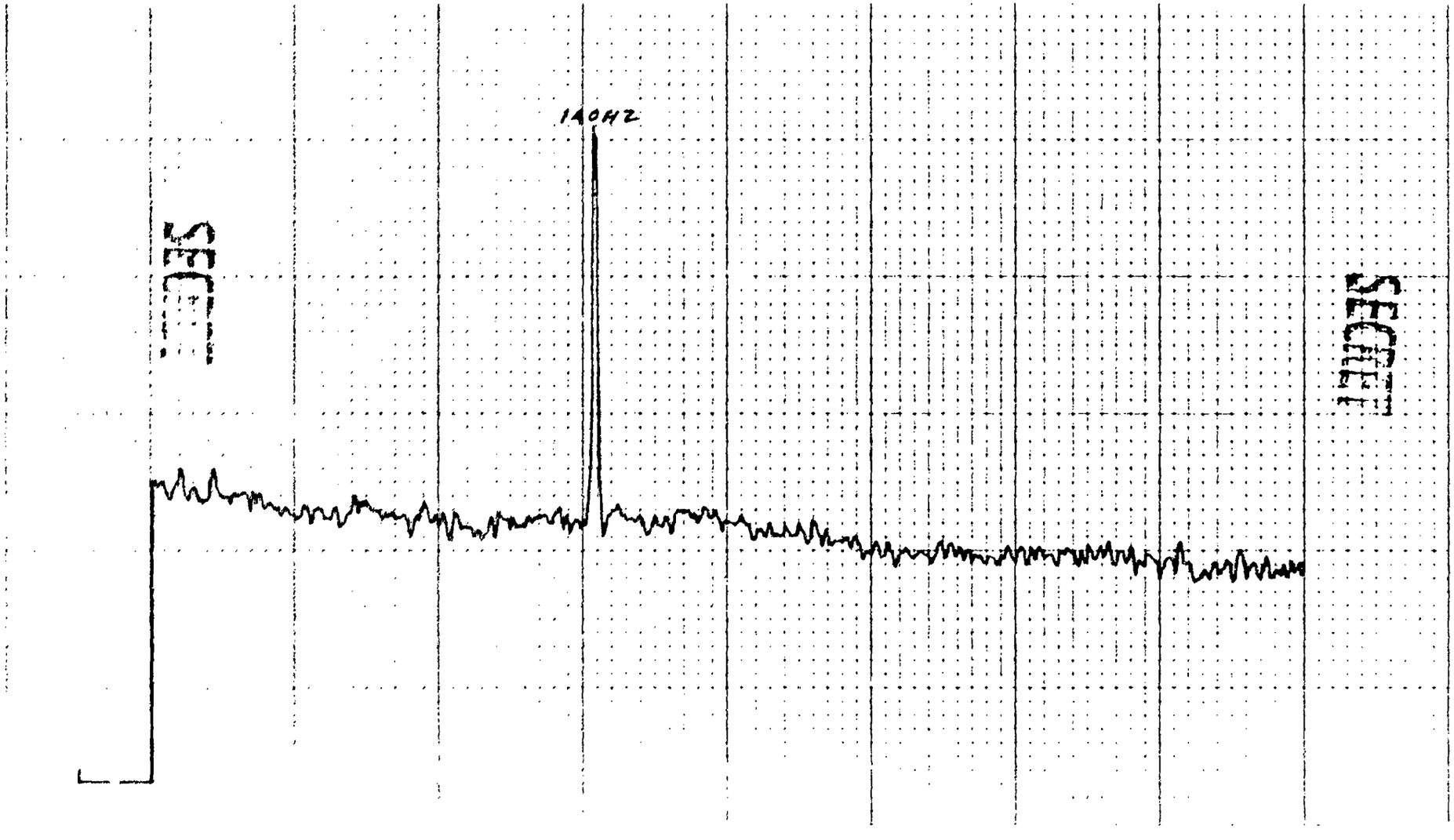


CONTROL: 0202-51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-20 DEG. AZ STEERING

REEL: F-9
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -30 DB

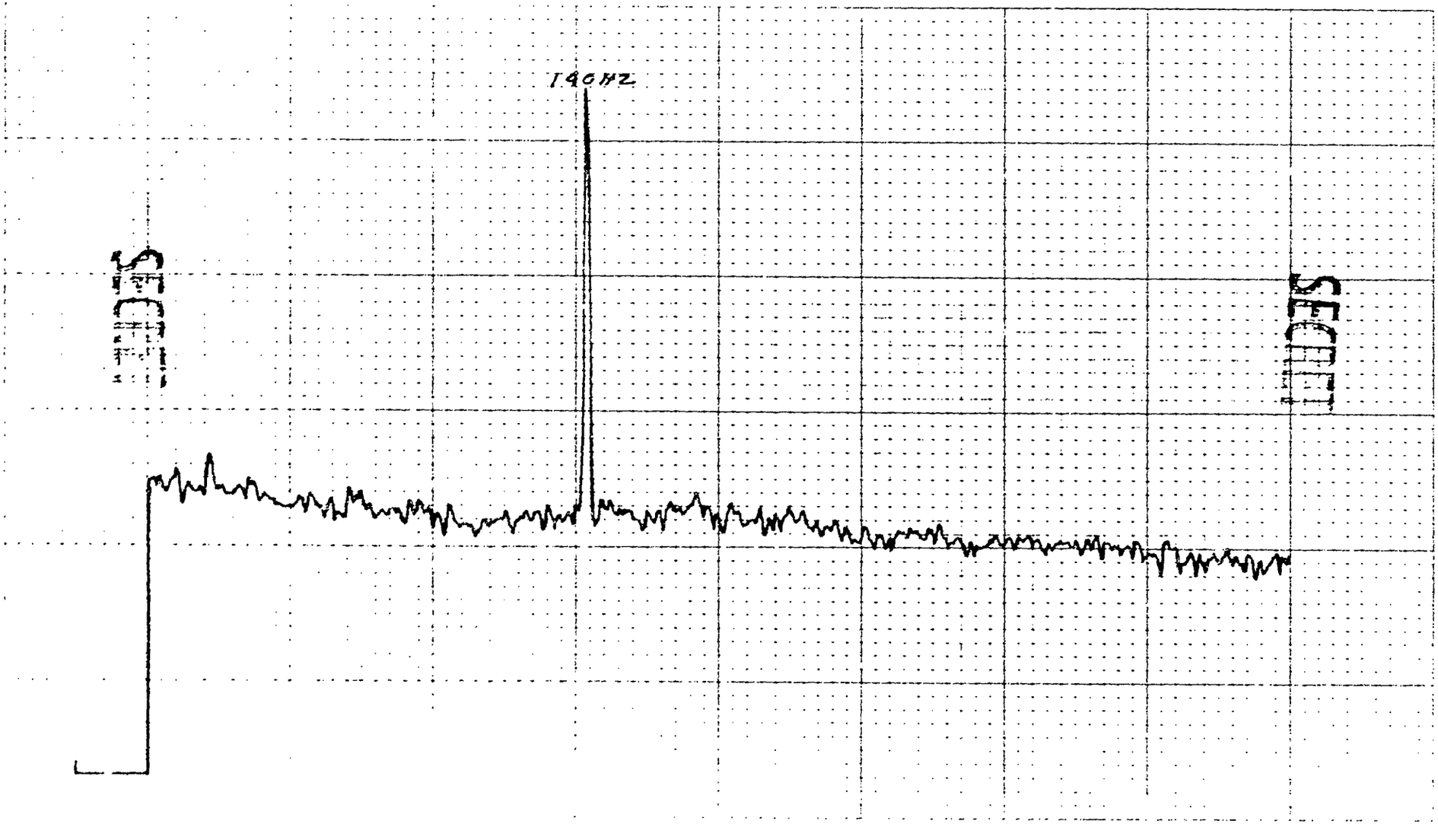


CONTROL: 0202-51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-30 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
FILTER
ATTEN: -30 DB
WTG: HANNING



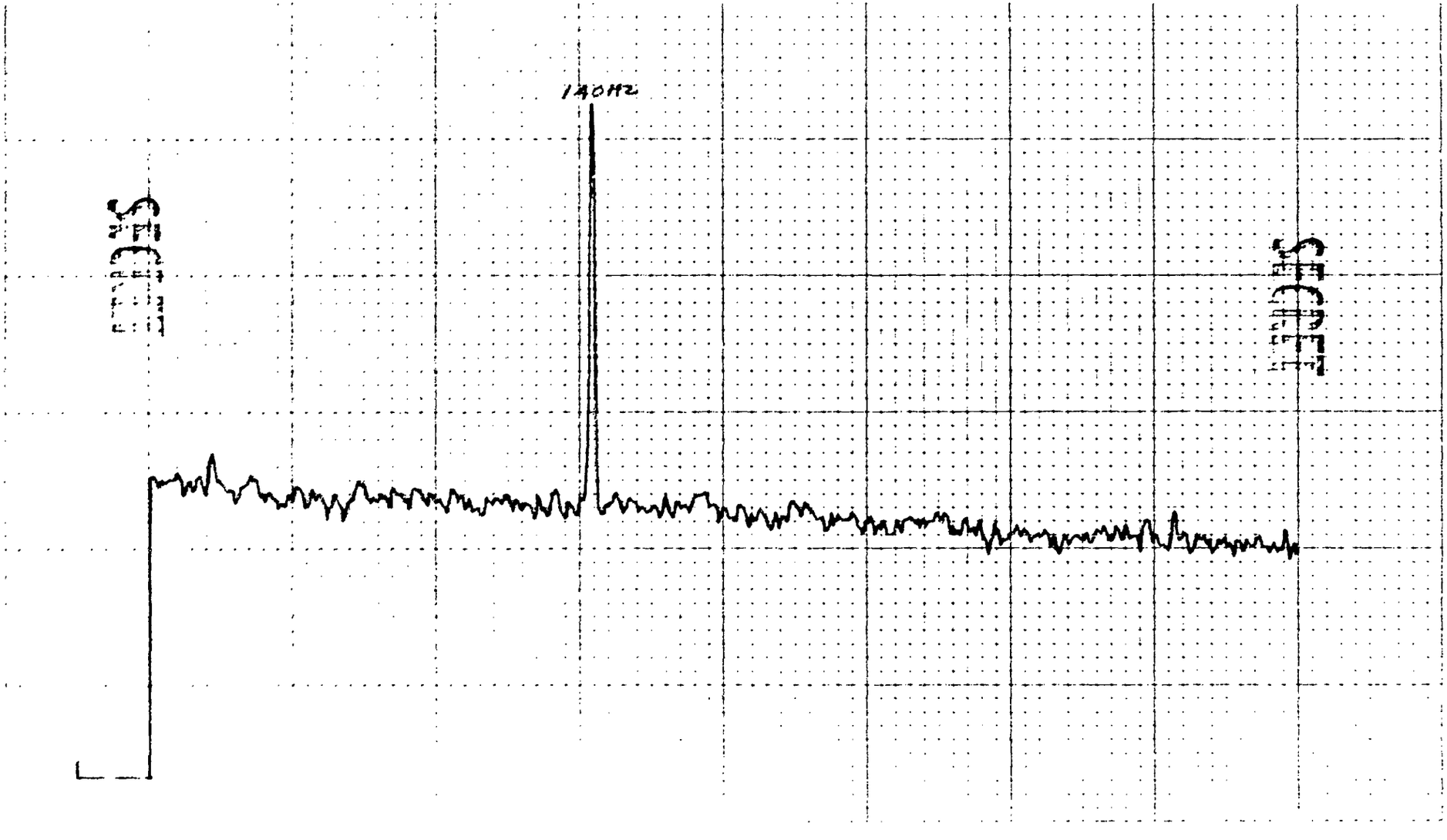
46 0703

CONTROL: 0202 - 51 (DOT)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-32 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



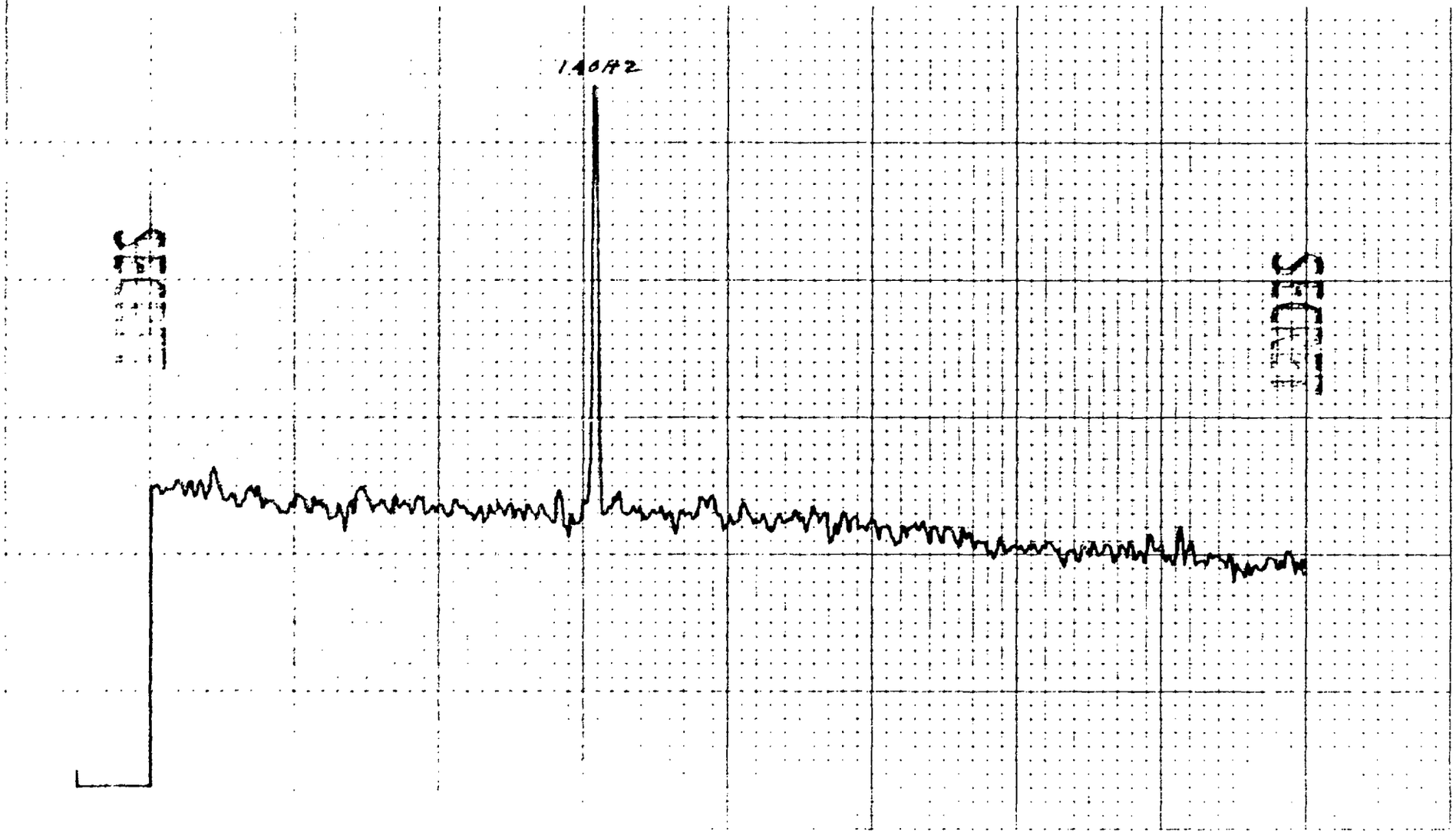
46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
— 74 DEG. AZ STEERING

REEL: F09
INDEX 1145

INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



K+E

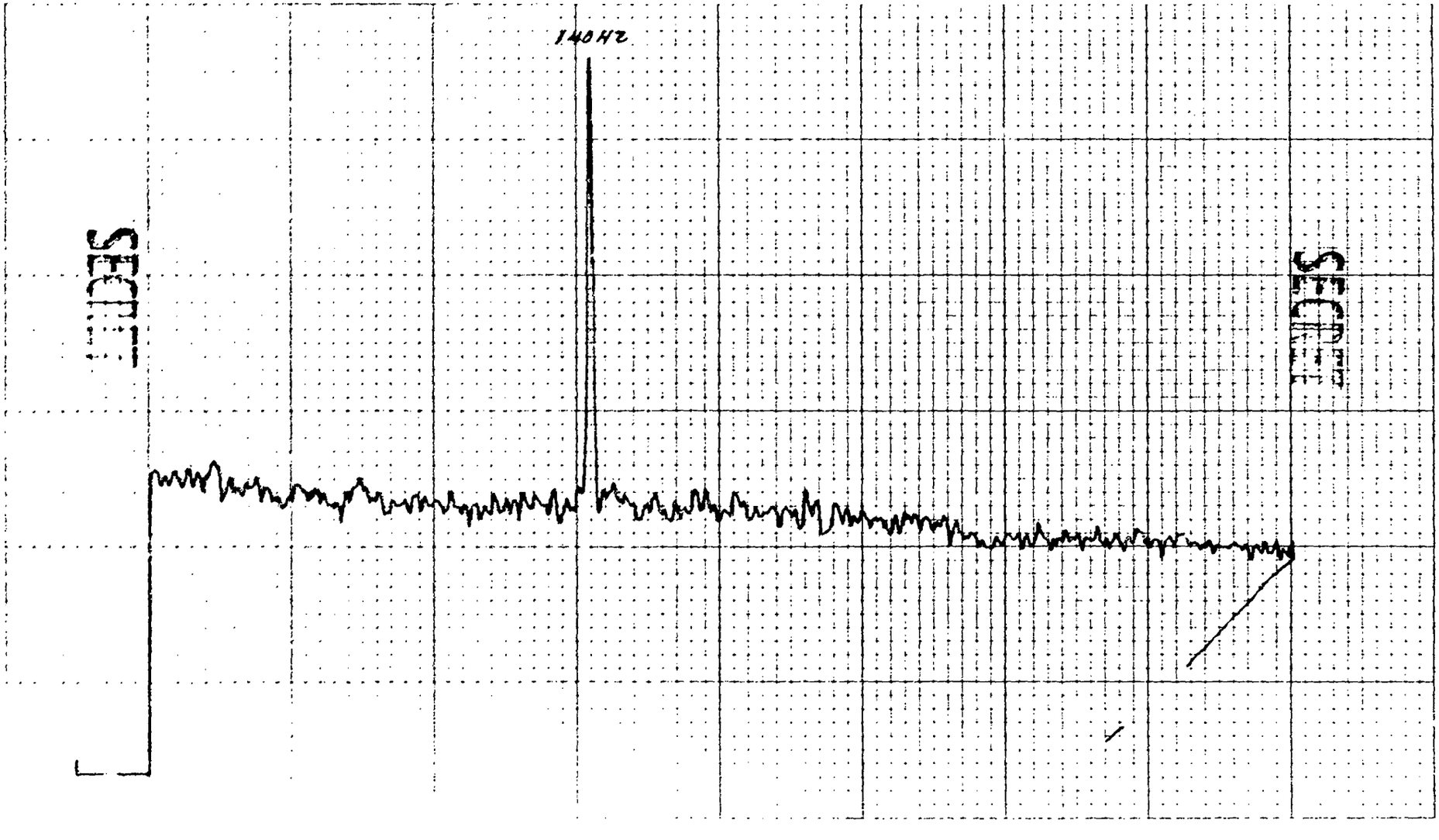
46 0703

CONTROL: 0202 - 51 (DIT)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-36 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: 30 DB



46 0703

REEL: F29 INDEX 1145

CONTROL: 0202 - 51 (297) DATE OF ANALYSIS: 1-26-79 29-53

BEAMFORMED SPECTRUM (ELEMENTS)

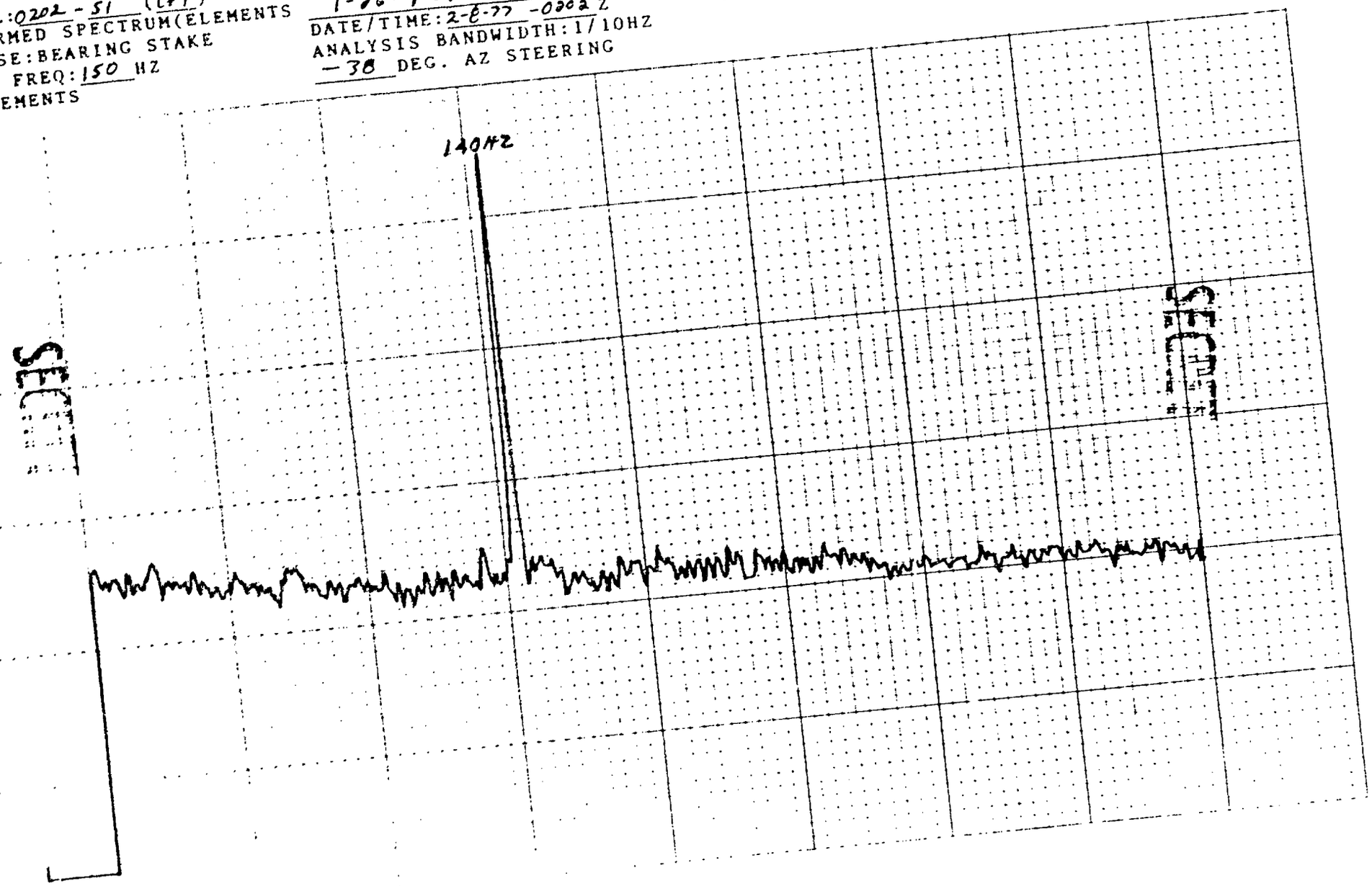
EXERCISE: BEARING STAKE DATE/TIME: 2-8-77 -0202 Z

CENTER FREQ: 150 HZ ANALYSIS BANDWIDTH: 1/10HZ

51 ELEMENTS -38 DEG. AZ STEERING

INTEGRATION TIME 320 SECS ATTEN: -70 DB

FILTER WTG: HANNING



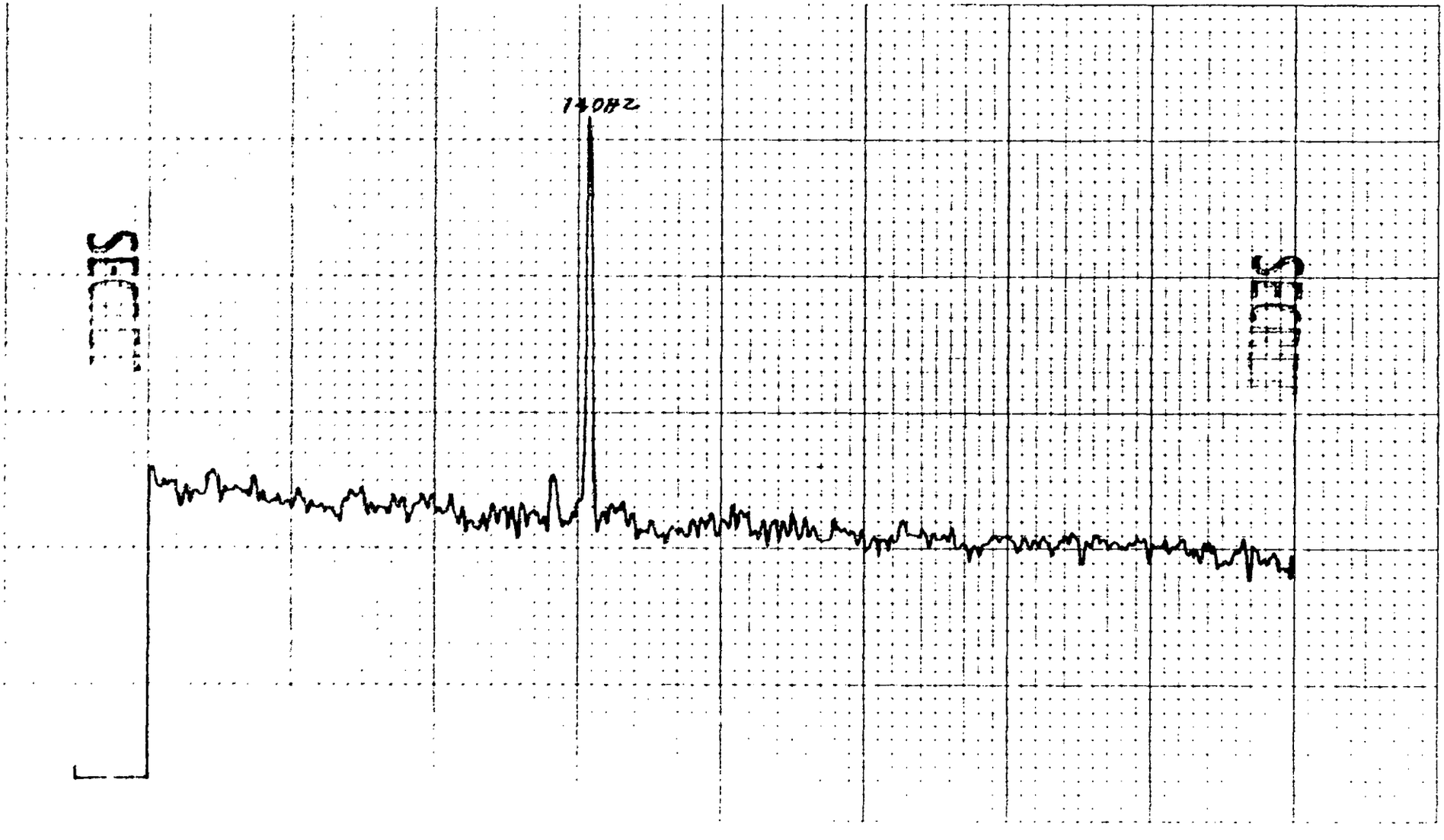
46 0703

CONTROL: 0202 - 51 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-40 DEG. AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: -30 DB
FILTER WTG: HANNING



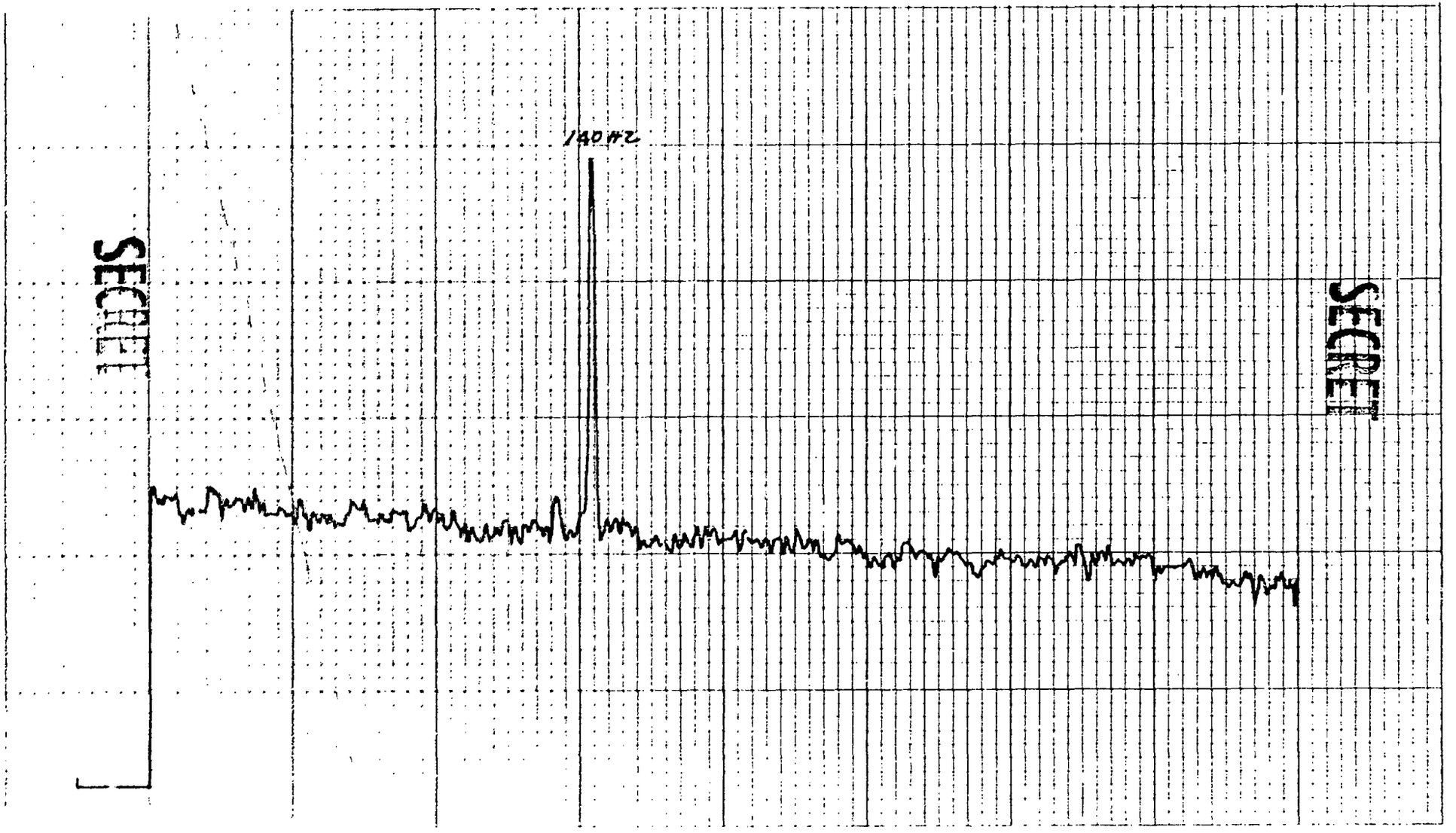
46 0703

CONTROL: 0202-51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-42 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



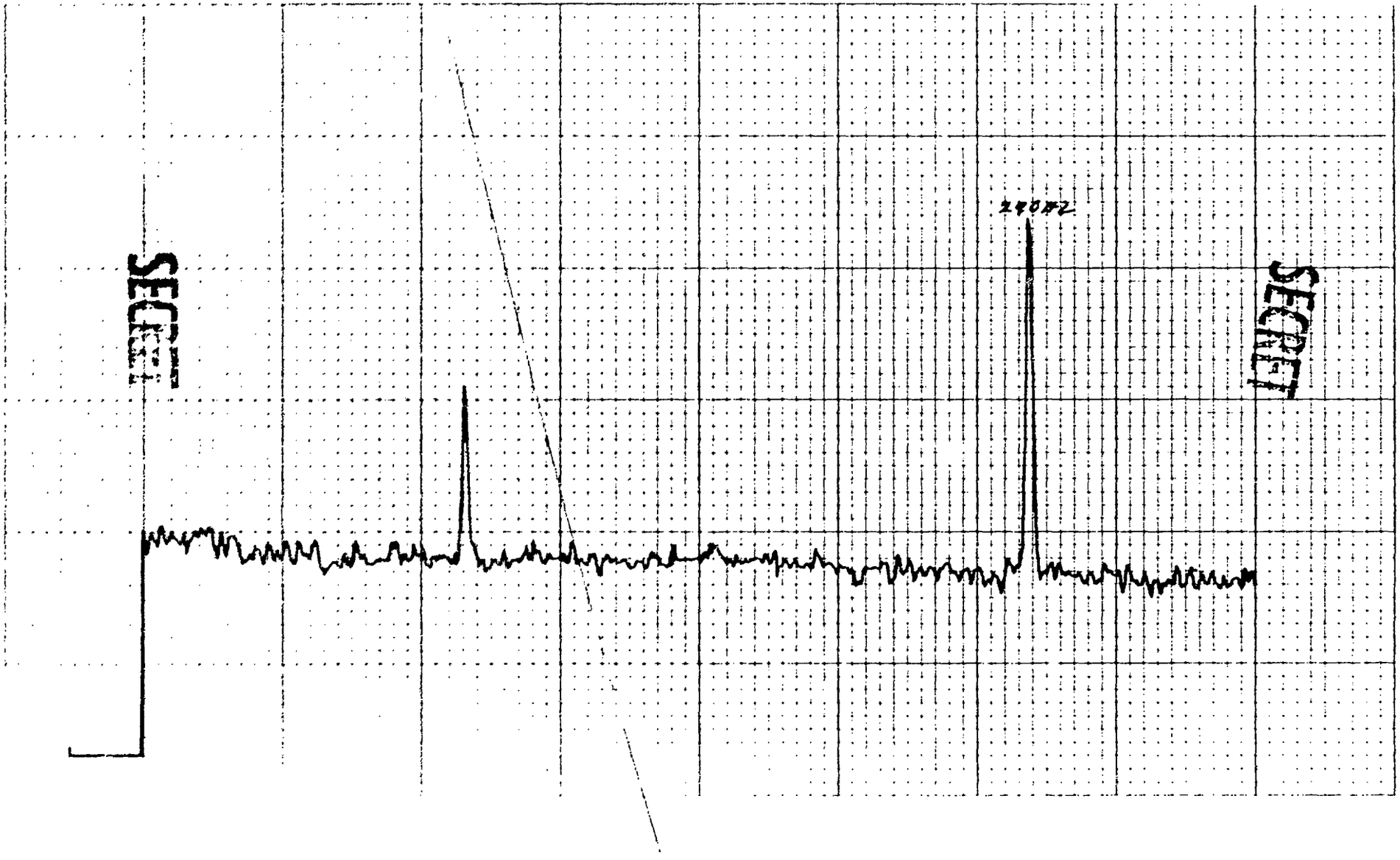
46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-12 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



CONTROL: 0202 - 51 (007)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-14 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

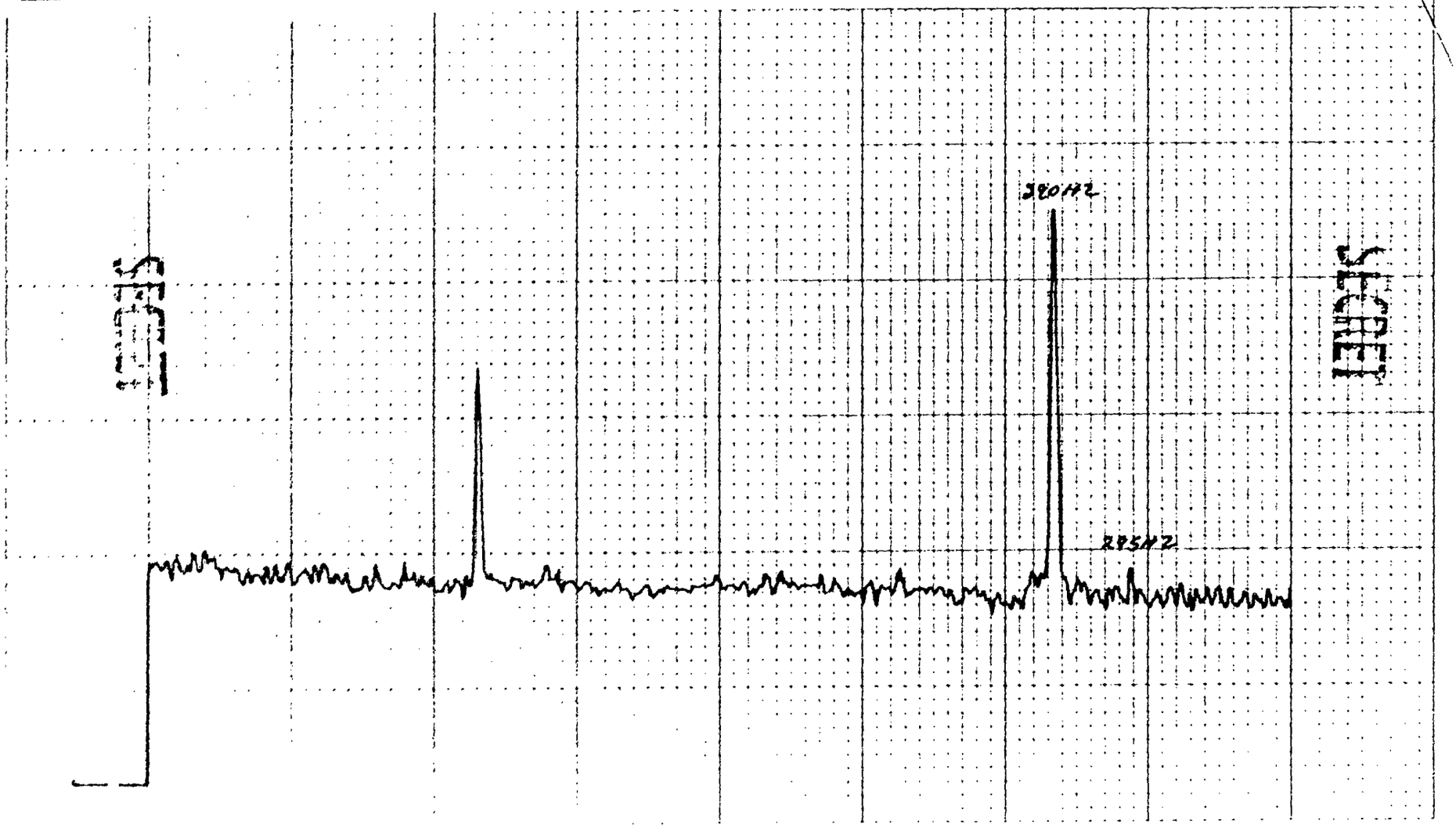
INDEX/145
ATTEN: -30 DB
WTG: HANNING

CONTROL: 0202-51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 89-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-16 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX: 145
ATTEN: -20 DB

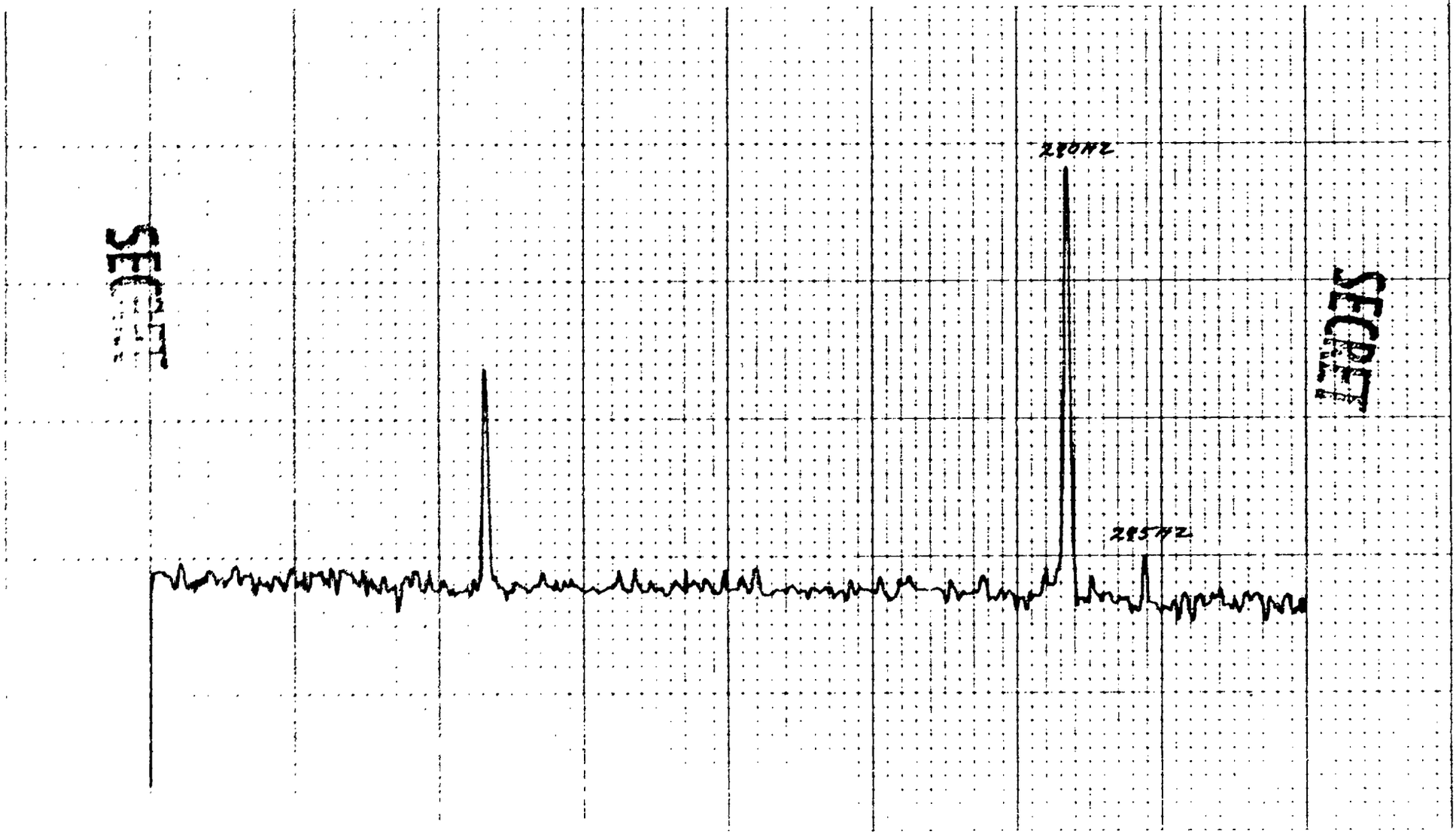


CONTROL: 0202-51 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 89-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 880 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-18 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX 1145
ATTEN: -30 DB
WTG: HANNING



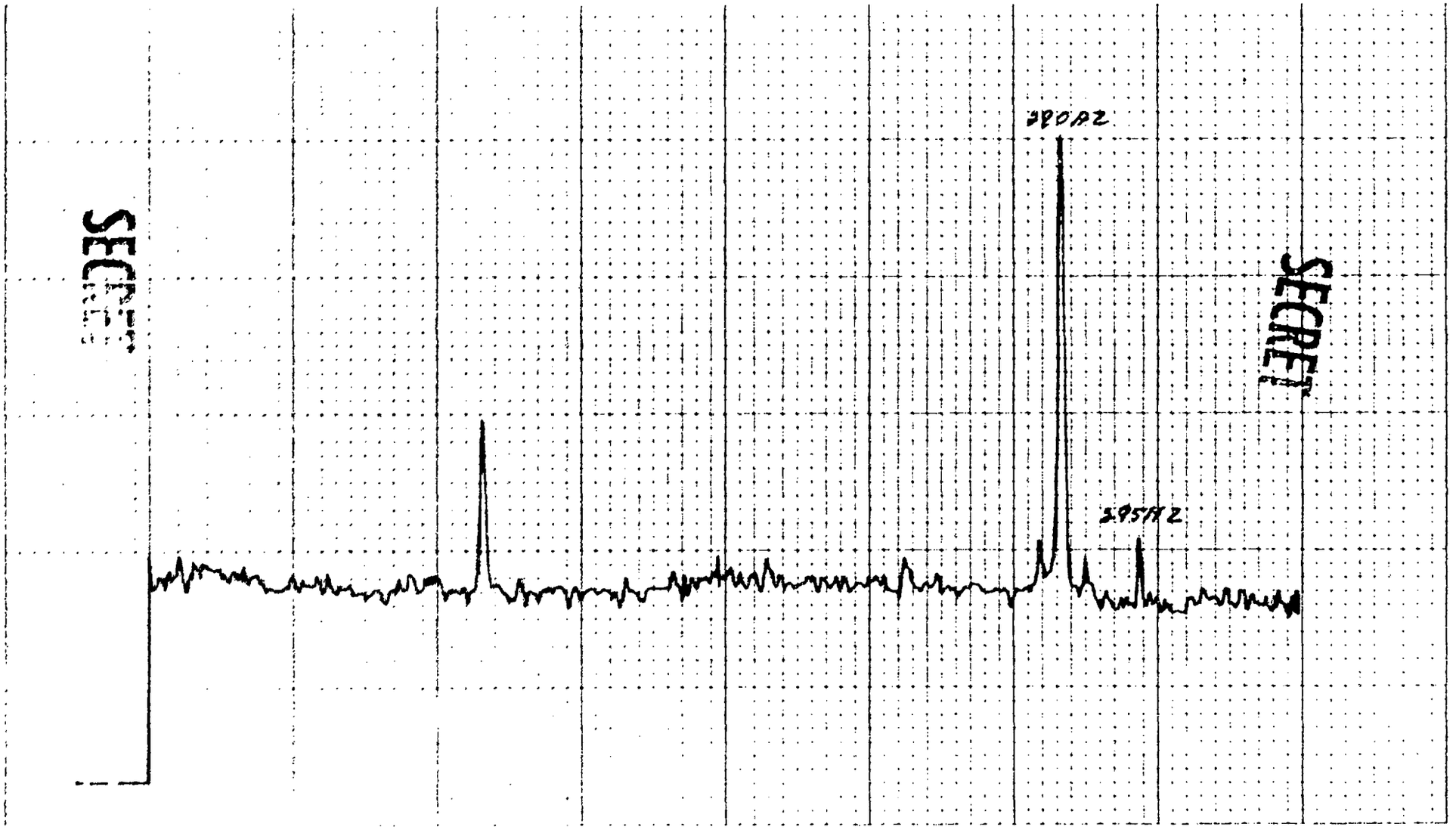
46 0703

CONTROL: 0202 - 51 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-20 DEG. AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: -30 DB
FILTER WTG: HANNING



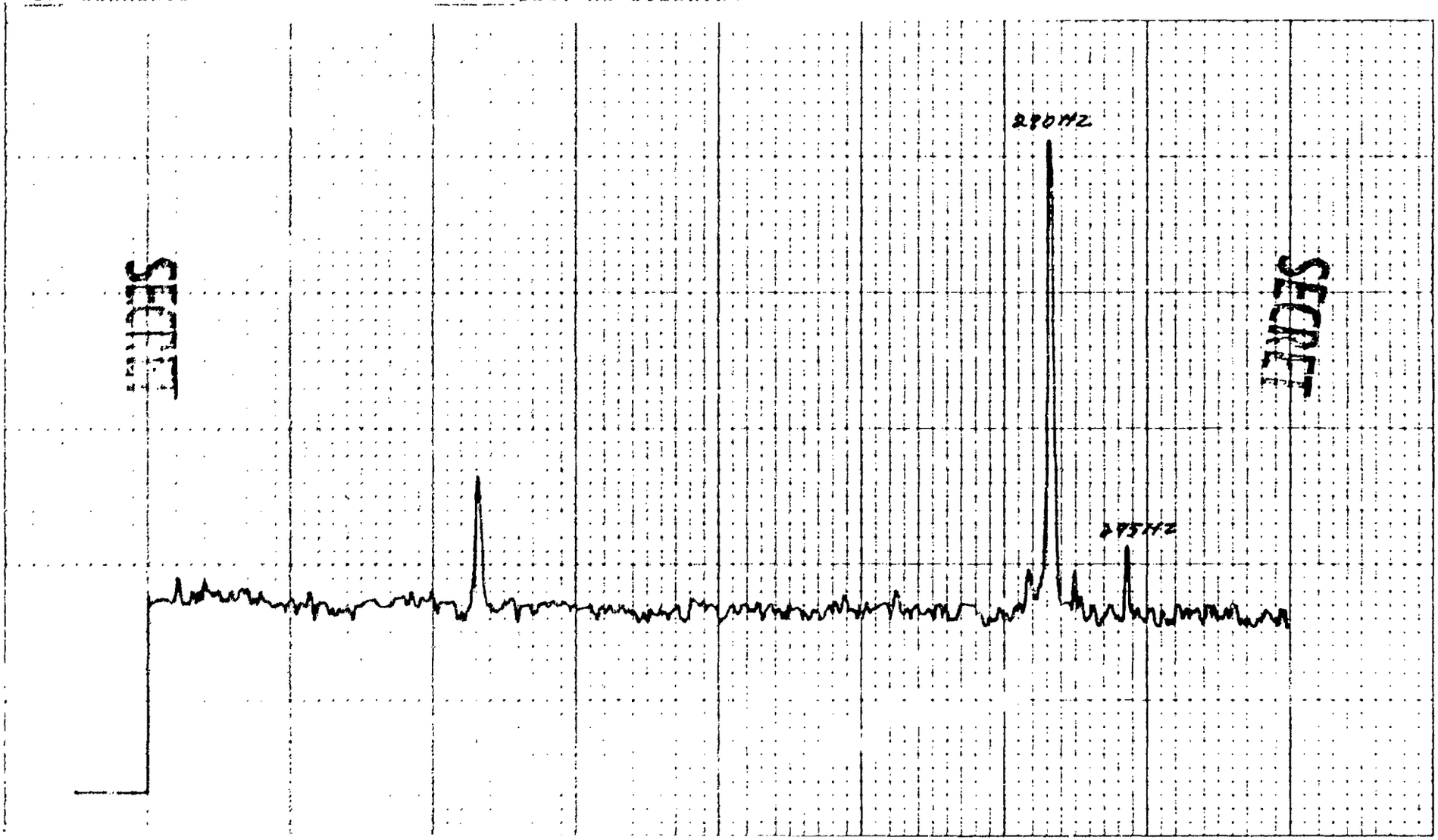
46 0703

CONTROL: 0202-51 (207)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-22 DEG. AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: -30 DB
FILTER WTG: HANNING



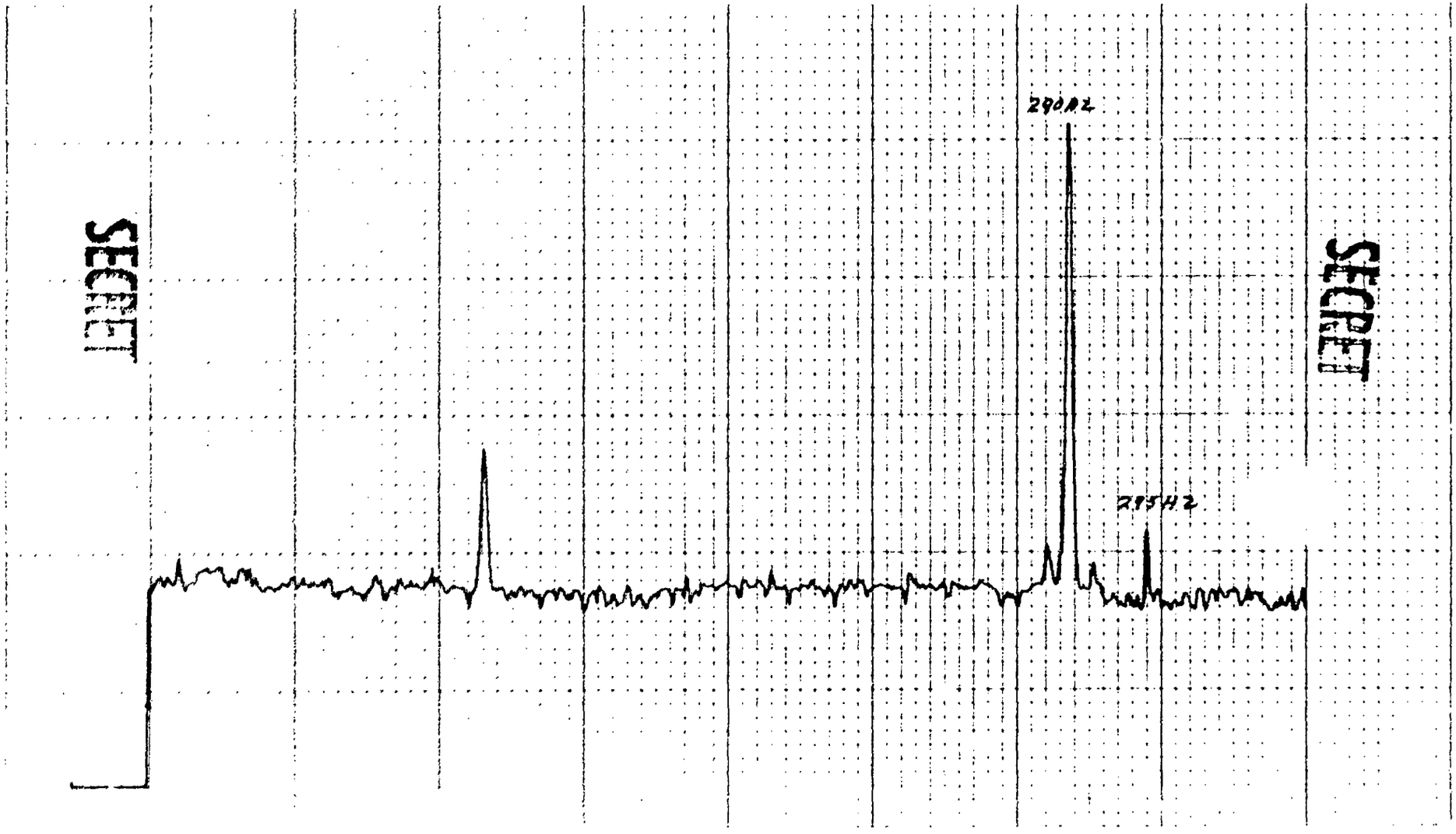
46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: __ __ __
1-26 & 29-53)
DATE/TIME: 28 77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-21 DEG. AZ STEERING

REEL: F29 INDEX 1145

INTEGRATION TIME 320 SECS ATTEN: 30 DB
FILTER WTG: HANNING

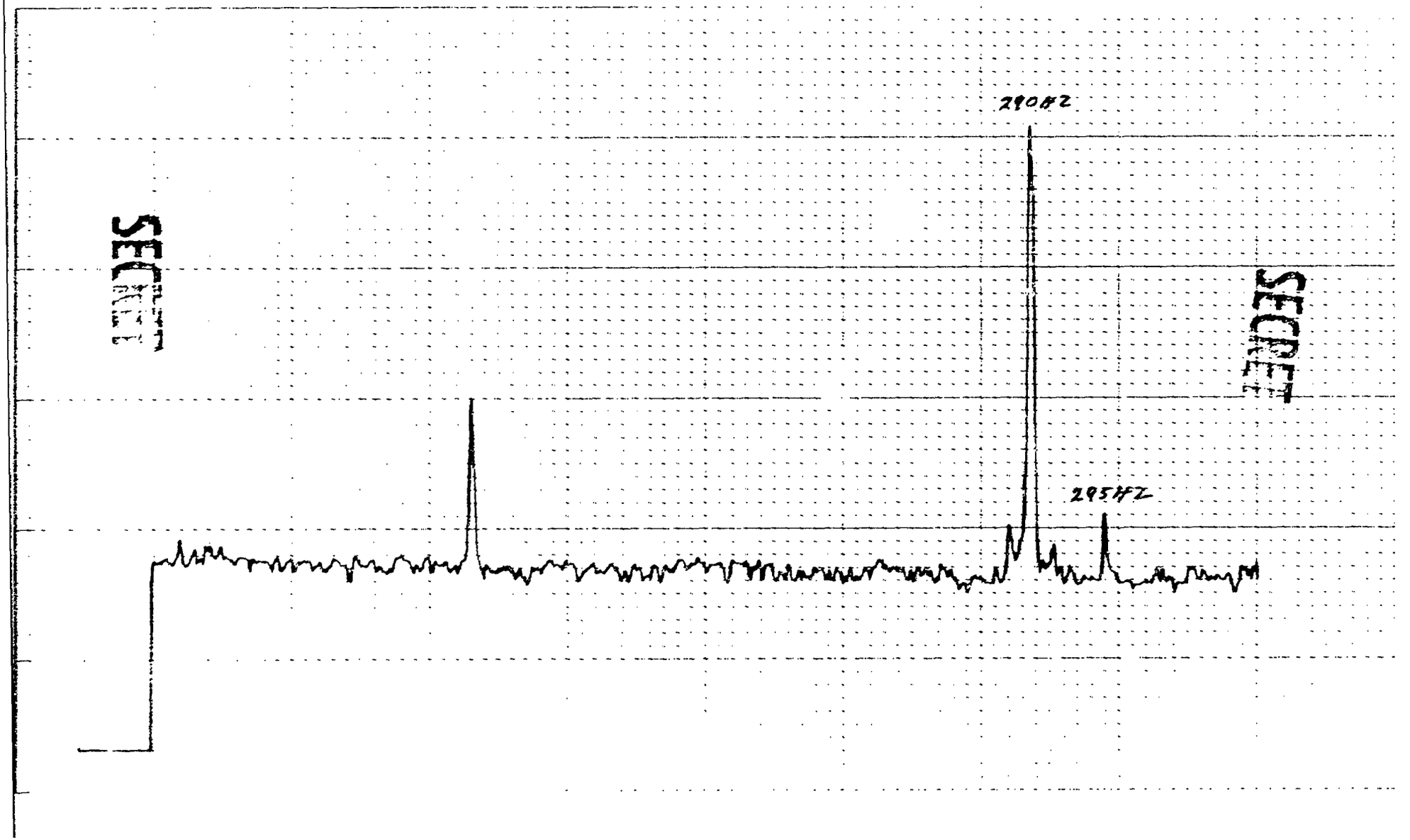


CONTROL: 0202-51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-23 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX X1145
ATTEN: -30 DB
WTG: HANNING



46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-04 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

ATTEN: -30DB

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SECRET

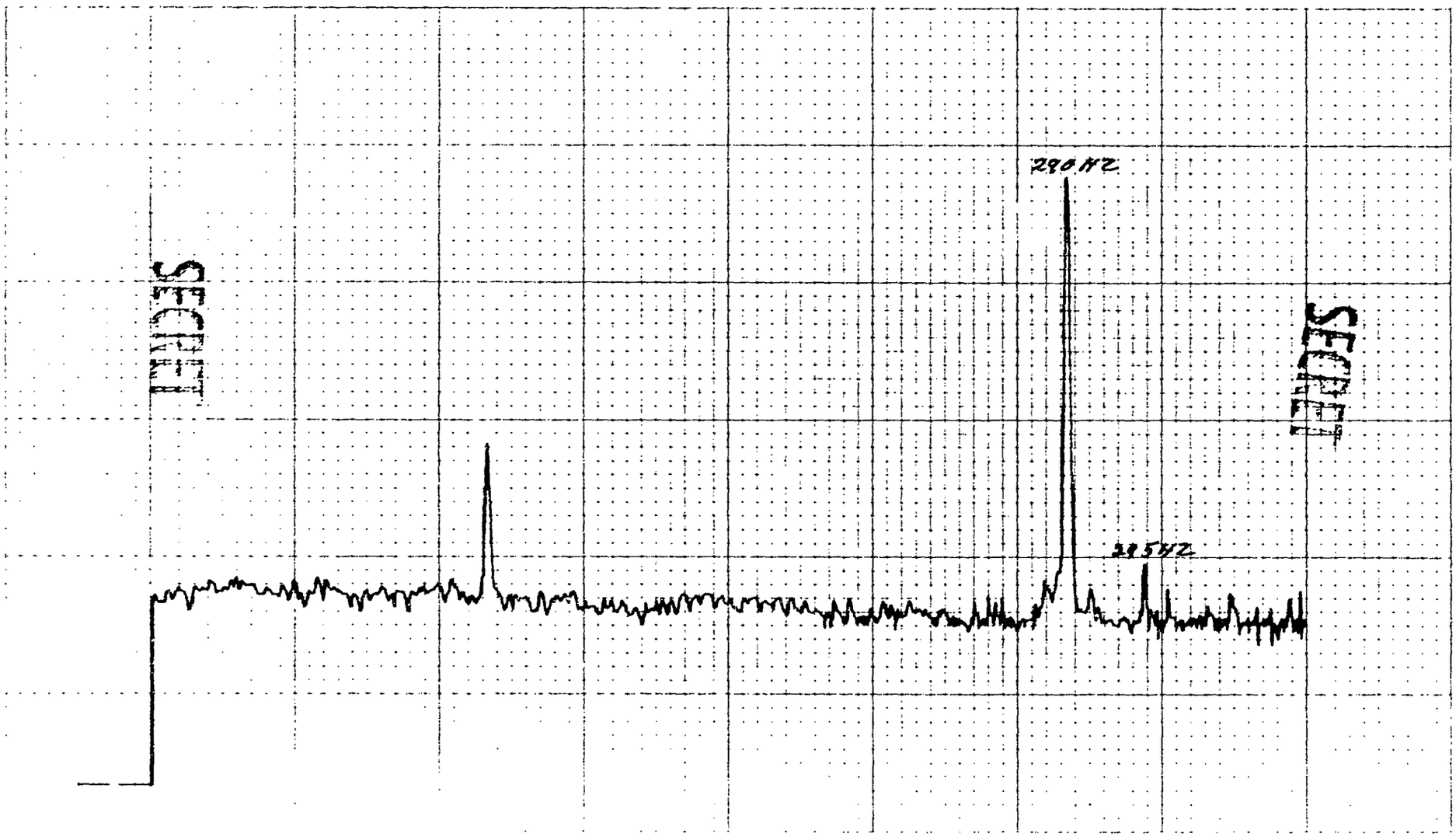
46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-26 DEG. AZ STEERING

REEL: F39
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -30 DB



46 0703

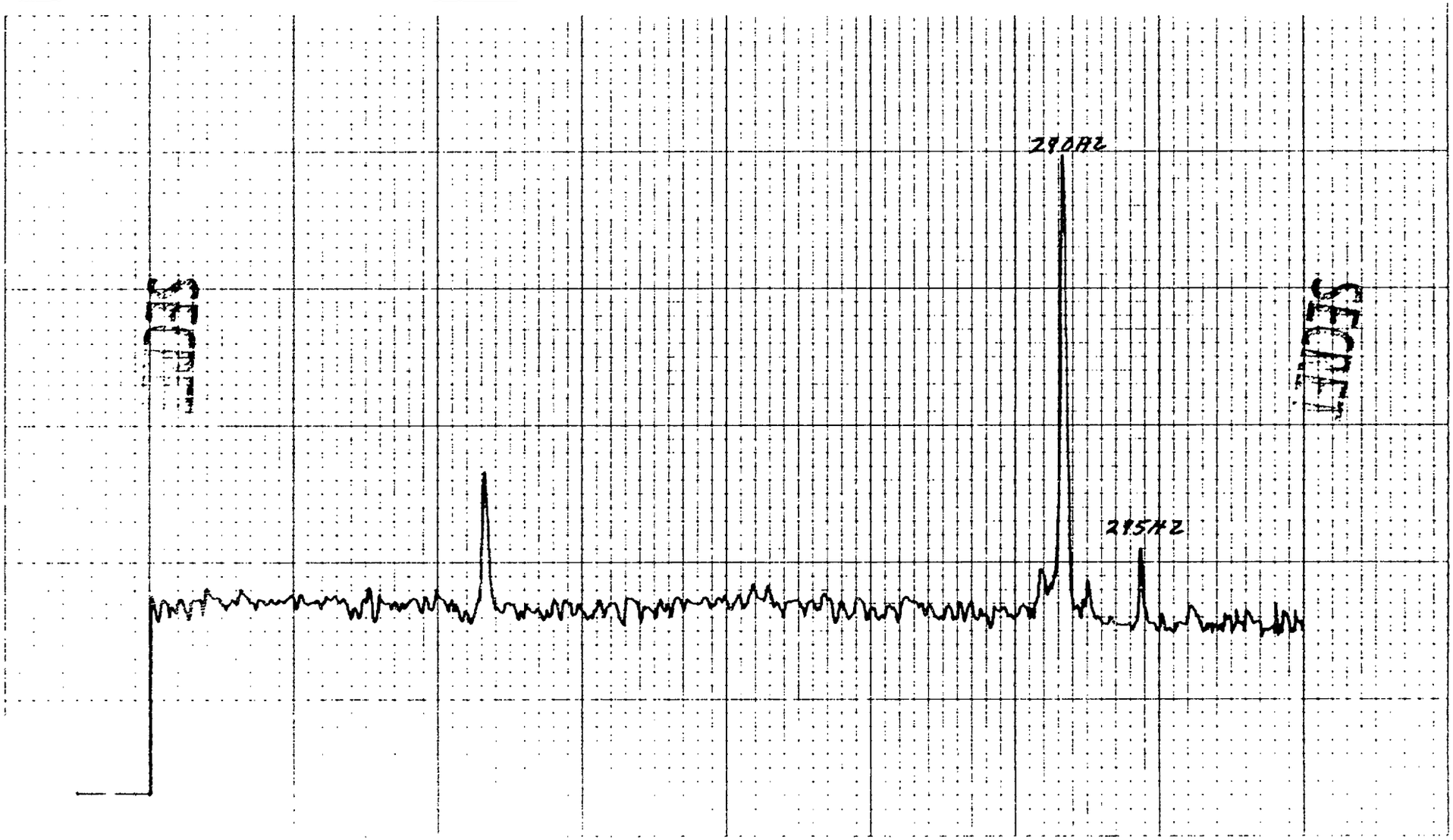
CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1- 26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-20 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

ATTEN: -30 DB



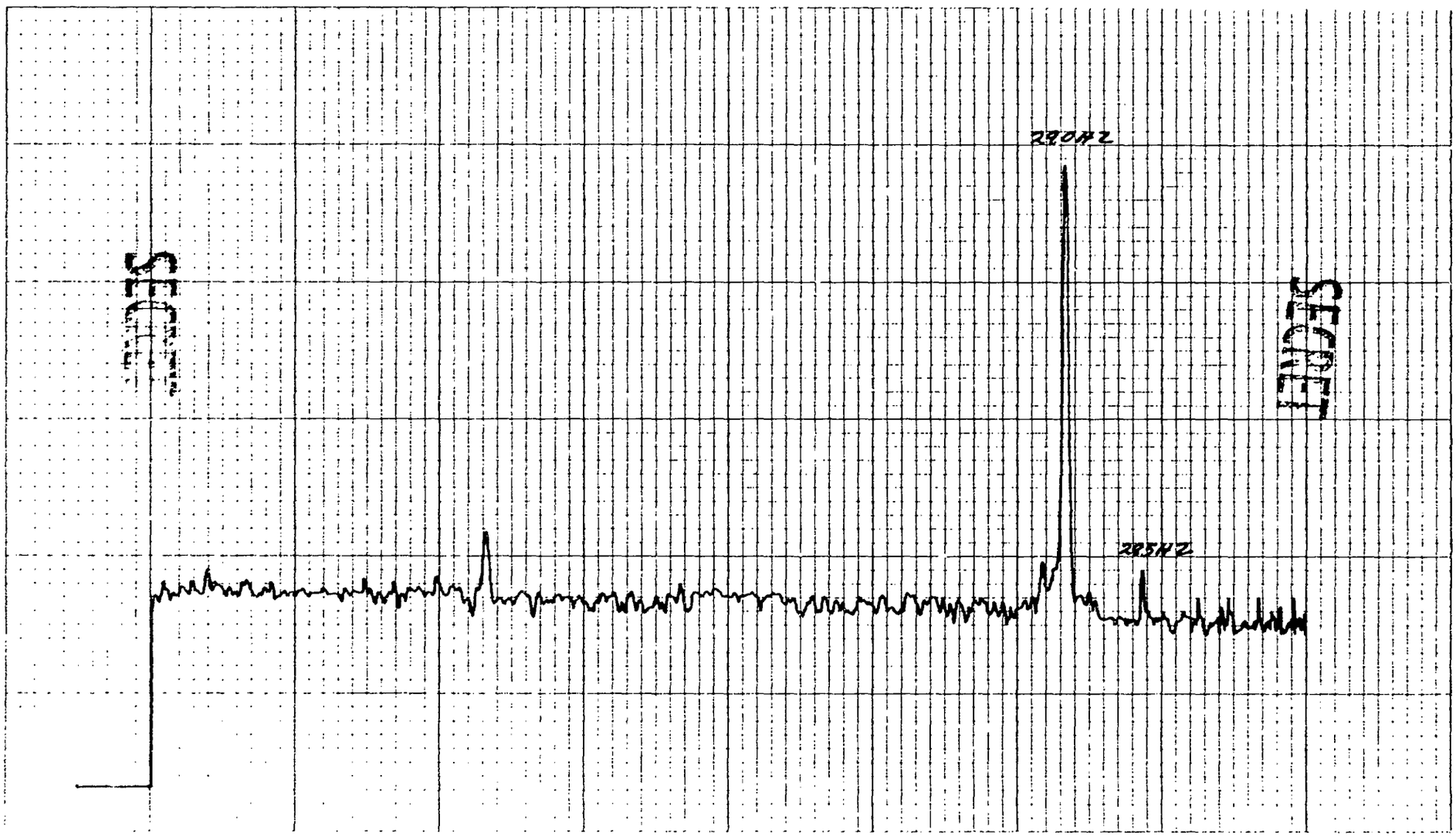
46 0703

CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-30 DEG. AZ STEERING

REEL: F29
INDEX 1145

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING
ATTEN: -30 DB



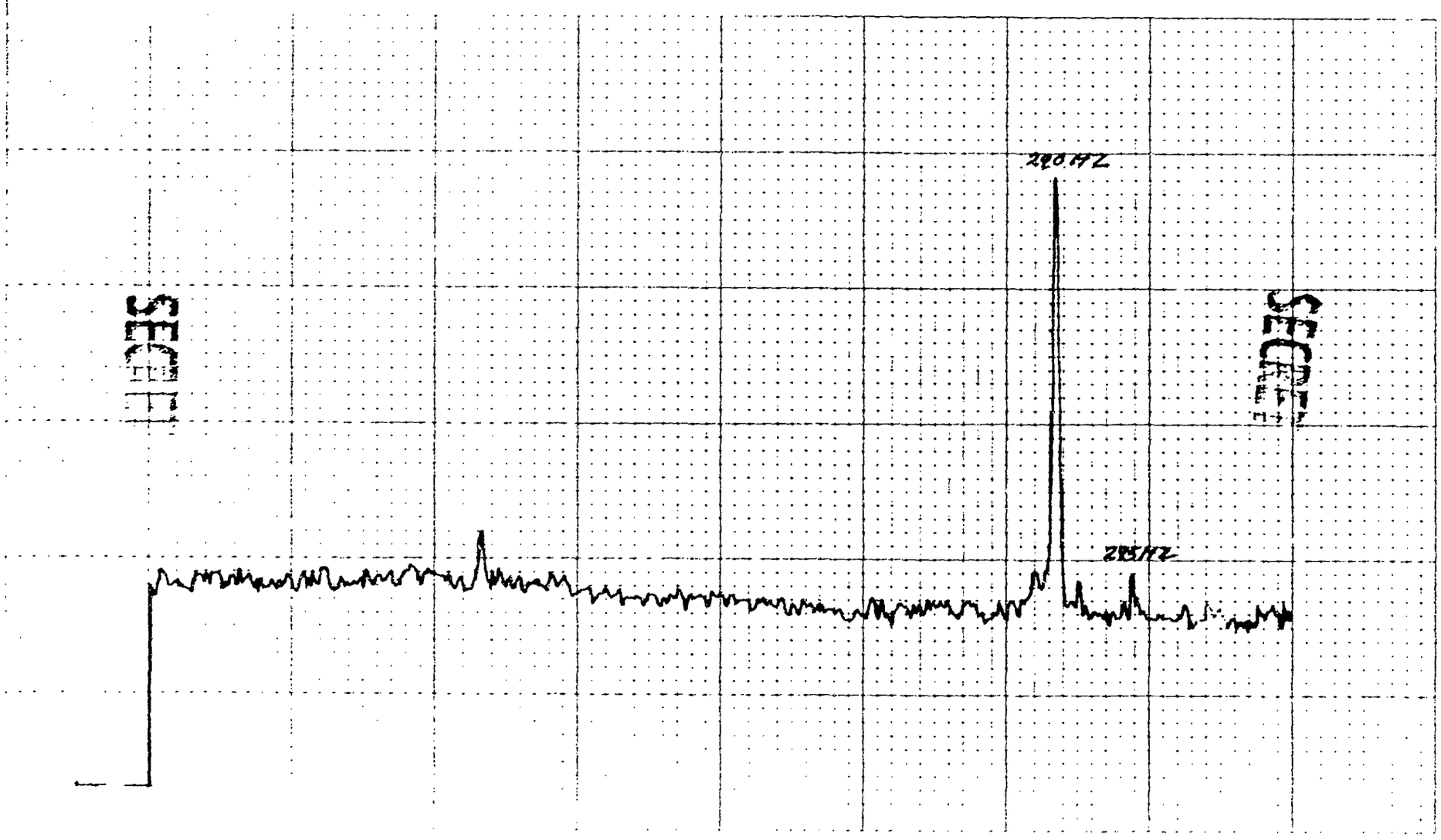
46 0703

CONTROL: 0202-51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-32 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

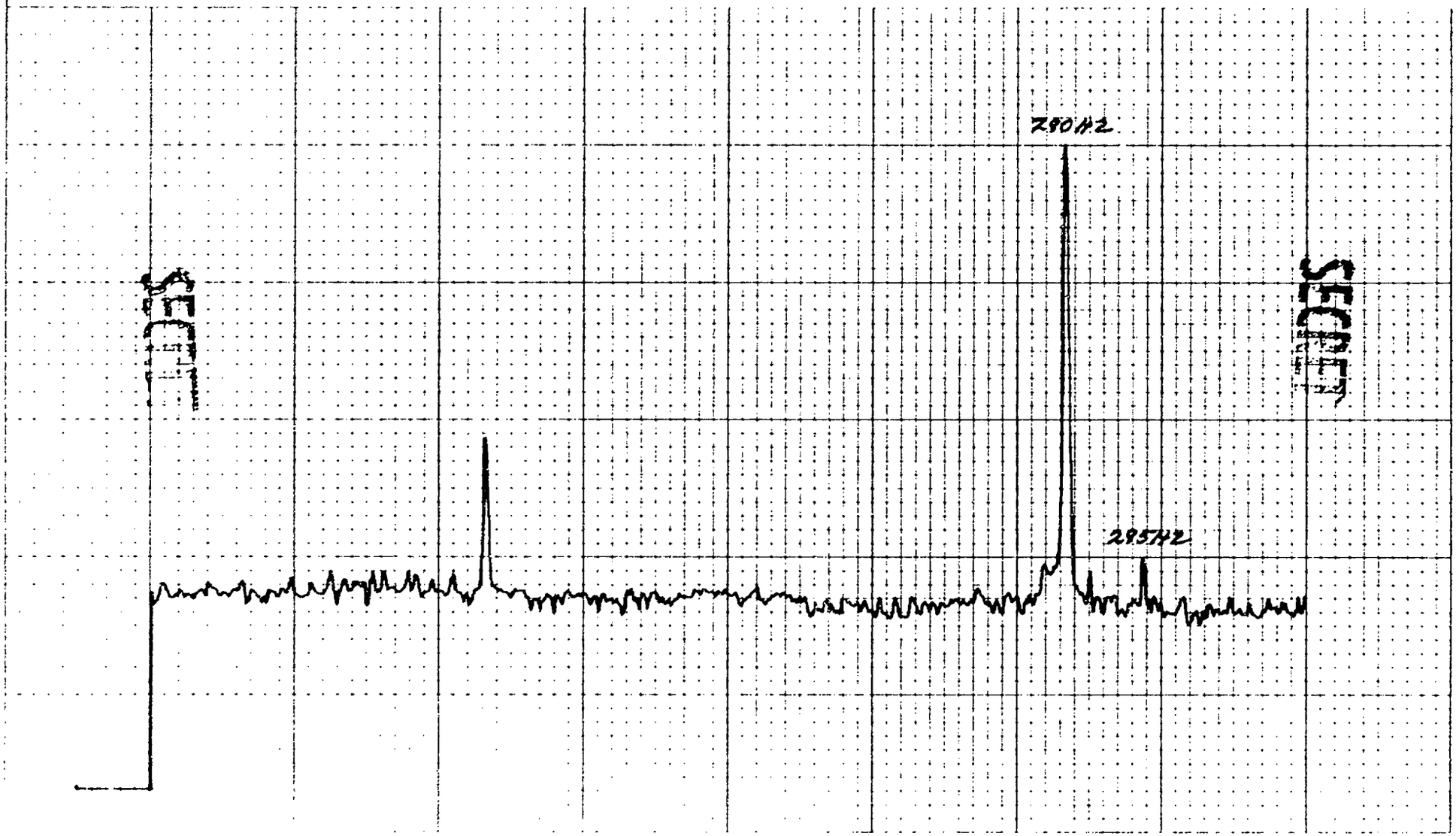
INDEX 1145
ATTEN: -30 DB
WTG: HANNING



CONTROL: 0202 - 51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-34 DEG. AZ STEERING

REEL: F29
INDEX 1145
INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



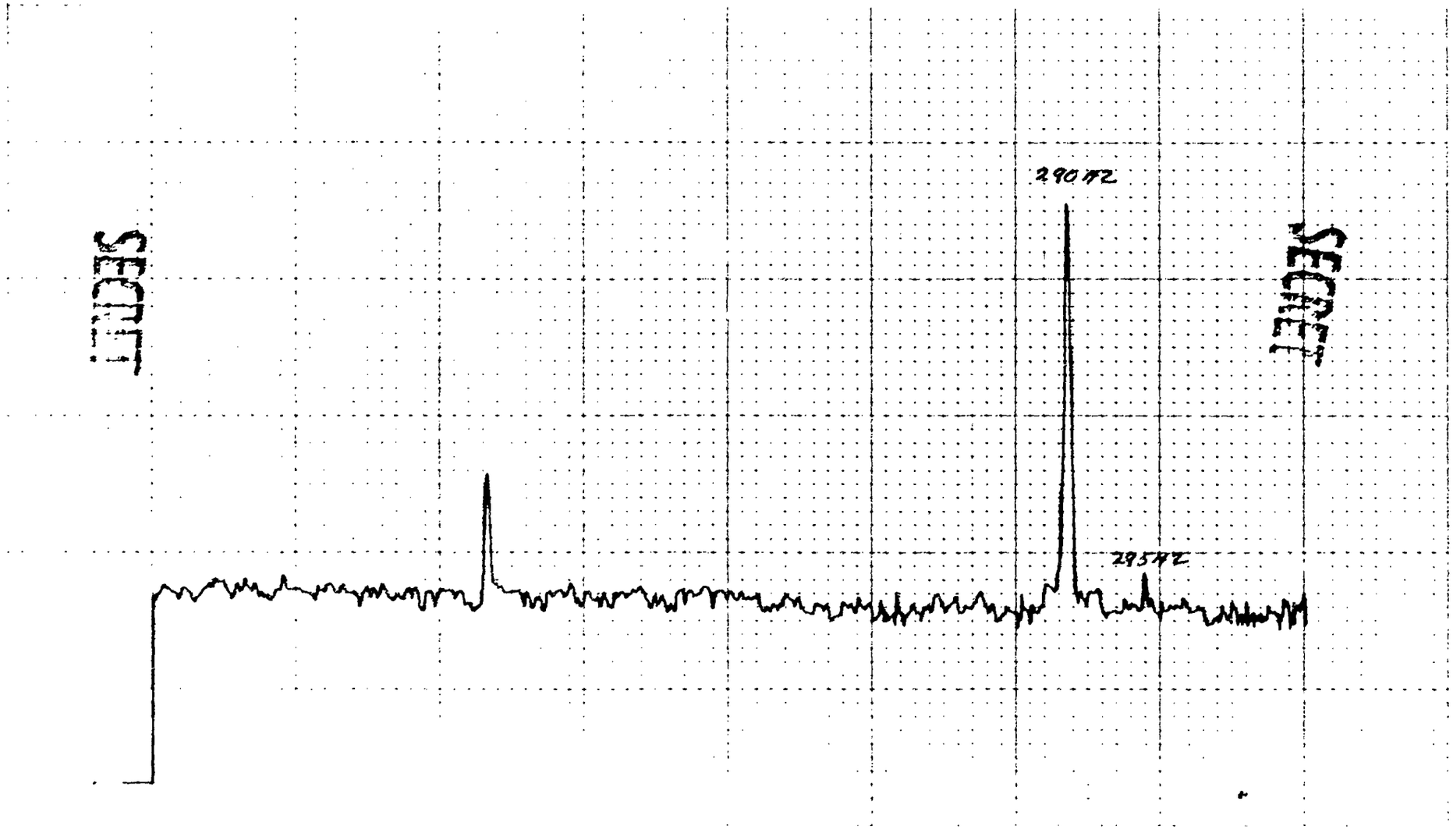
46 0703

CONTROL: 0202 - 51 (DPT)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 -0202 Z
ANALYSIS BANDWIDTH: 1/10HZ
-36 DEG. AZ STEERING

REEL: F39
INTEGRATION TIME 320 SECS
FILTER

INDEX 1140
ATTEN: -30 DB
WTG: HANNING

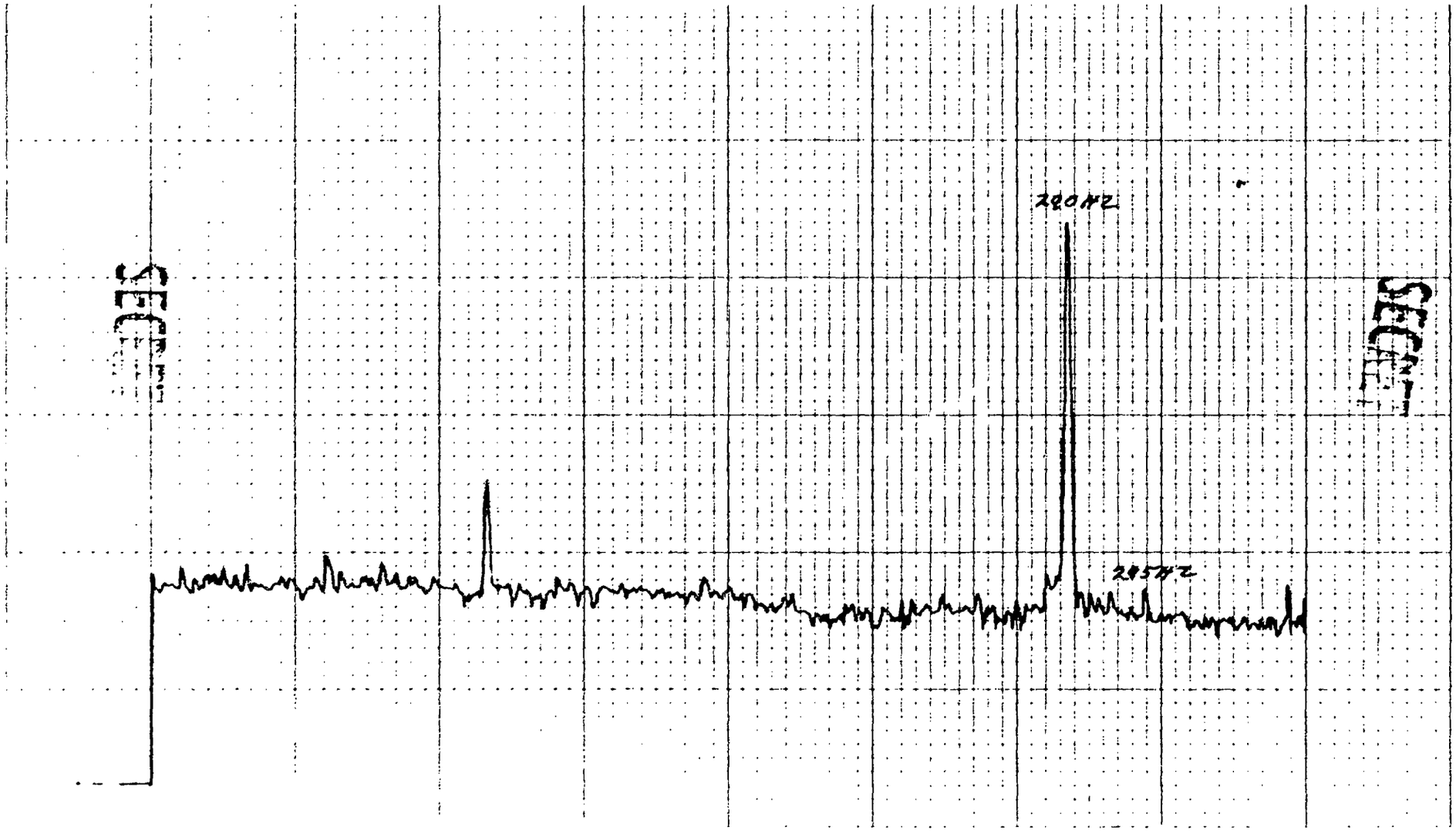


CONTROL: 0202 - 51 (207)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 2-8-77 -02022
ANALYSIS BANDWIDTH: 1/10HZ
-38 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER

INDEX/145
ATTEN: -30 DB
WTG: HANNING

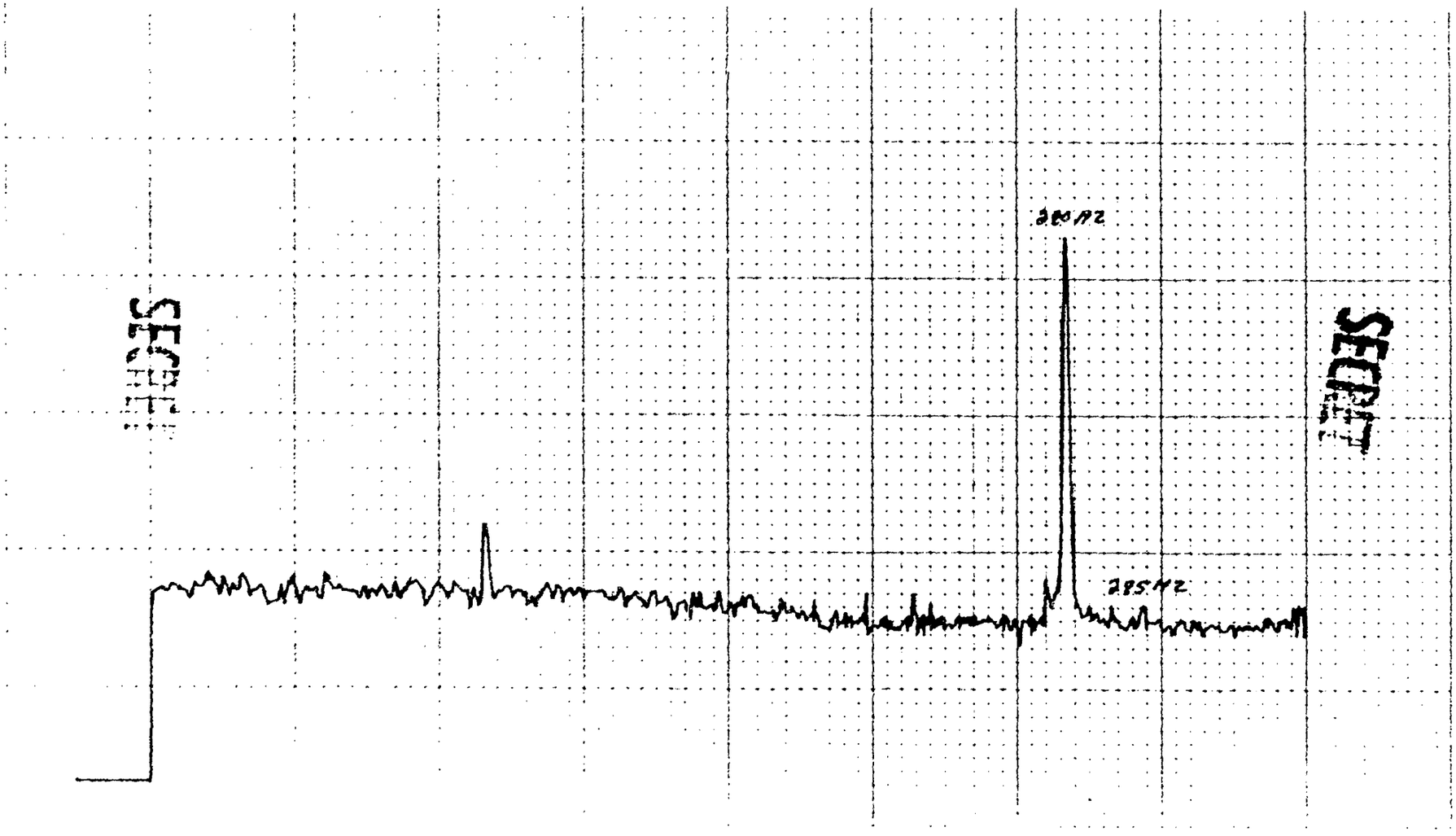


CONTROL: 0202-51 (DP7)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-8-77 -0202Z
ANALYSIS BANDWIDTH: 1/10HZ
-40 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -30 DB



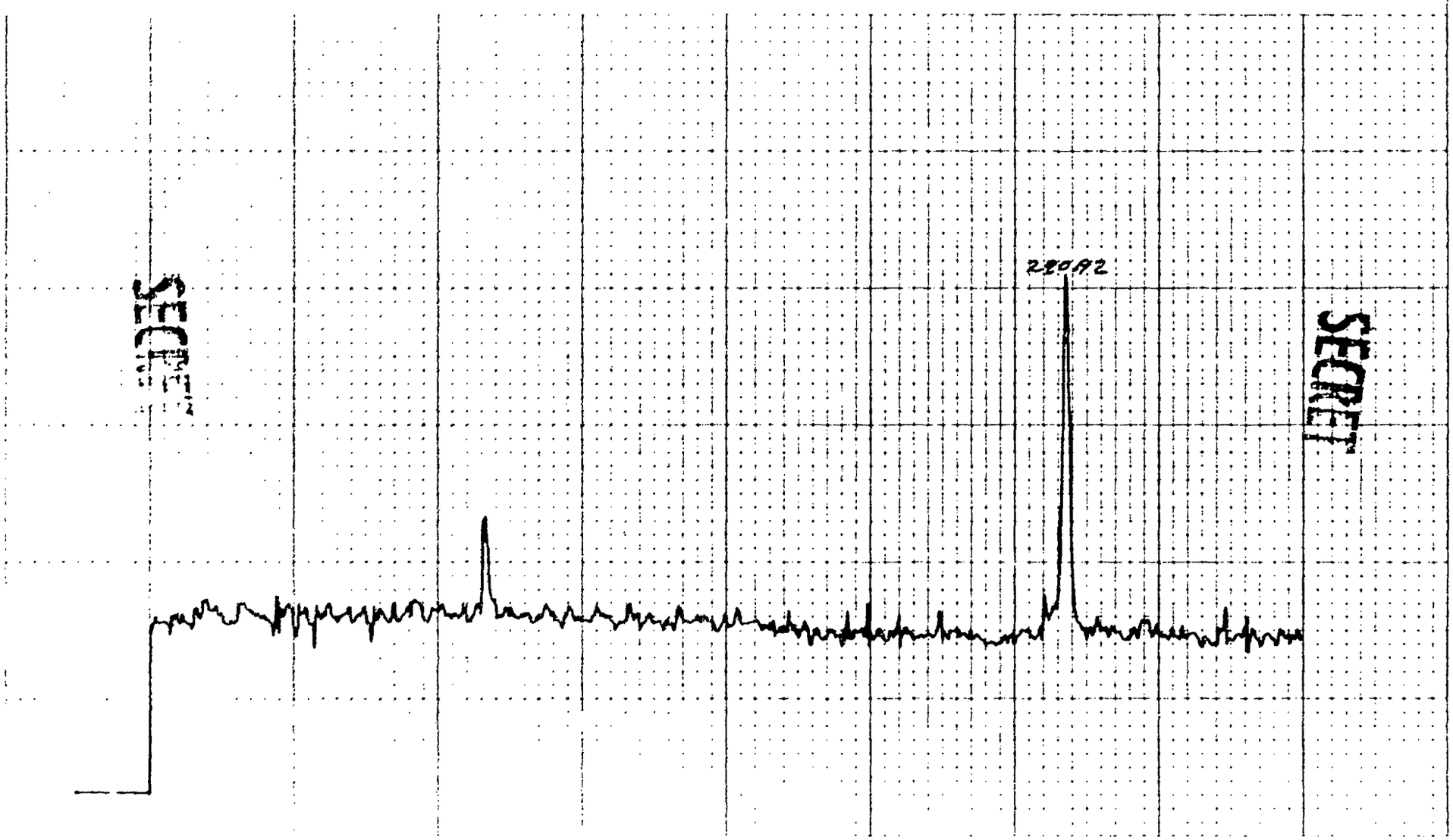
46 0703

CONTROL: 0202 - 51 (D07)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-8-77 - 0202
ANALYSIS BANDWIDTH: 1/10HZ
-42 DEG. AZ STEERING

REEL: F29
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 1145
ATTEN: -30DB



NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 8 DATE 3-15-77 TIME 1501Z

FREQUENCY 140 HZ

INDICATED NOISE LEVEL dBV 1/10 ABW		-52.9
SYSTEM SENSITIVITY dB/μB	-(-12)	= -40.9
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	= -32.7
CONVERSION TO dBreμPa/1HZ	+100	= +67.3

UNCLASSIFIED

UNCLASSIFIED

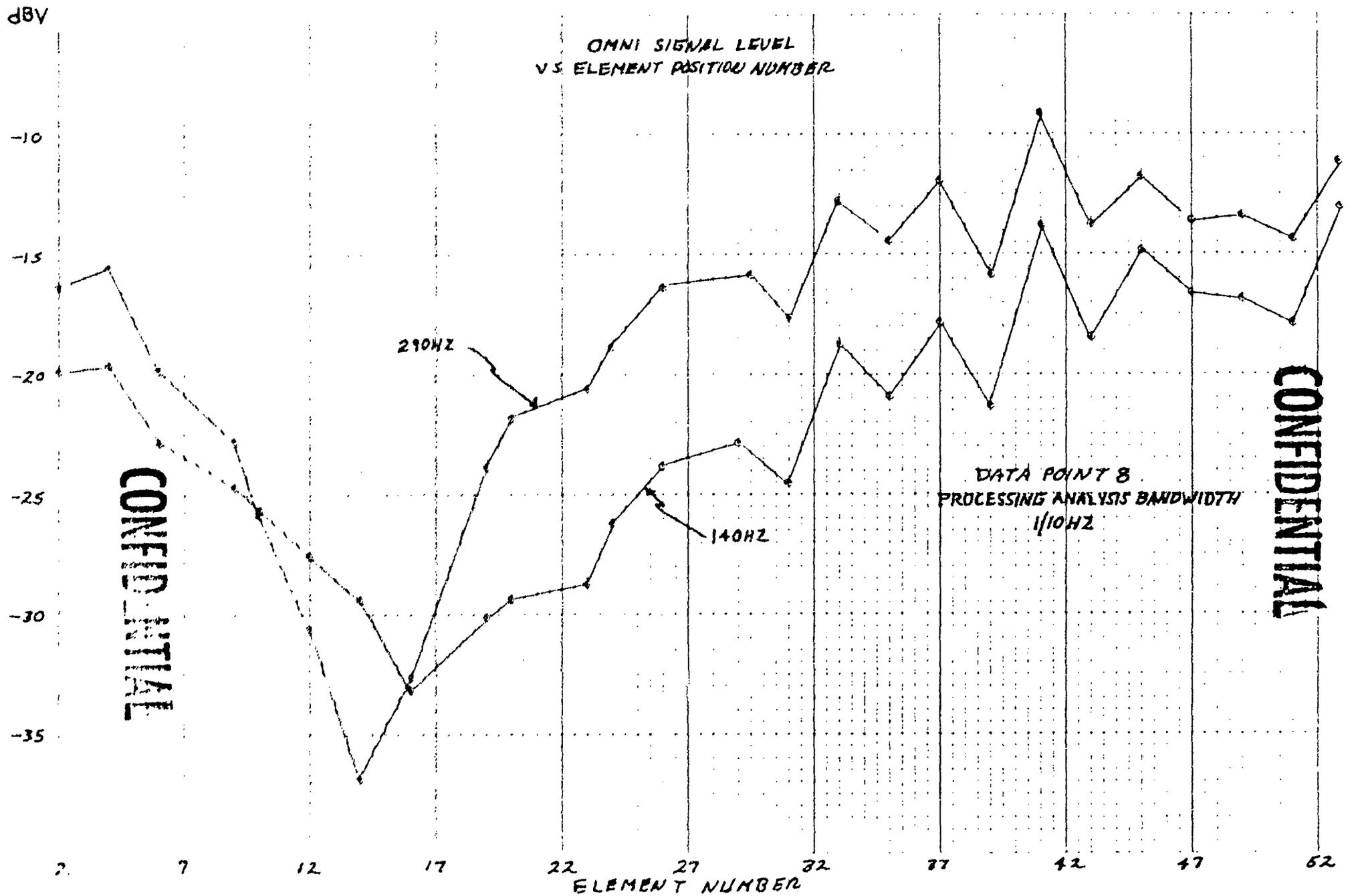
NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 8 DATE 3-15-77 TIME 1501Z

FREQUENCY 290 HZ

INDICATED NOISE LEVEL dBV $\frac{1\mu o}{ABW}$			-54.6
SYSTEM SENSITIVITY dB/μB	-(-8)	=	-46.6
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	=	-38.4
CONVERSION TO dBreμPa/1HZ	+100	=	+61.6

UNCLASSIFIED

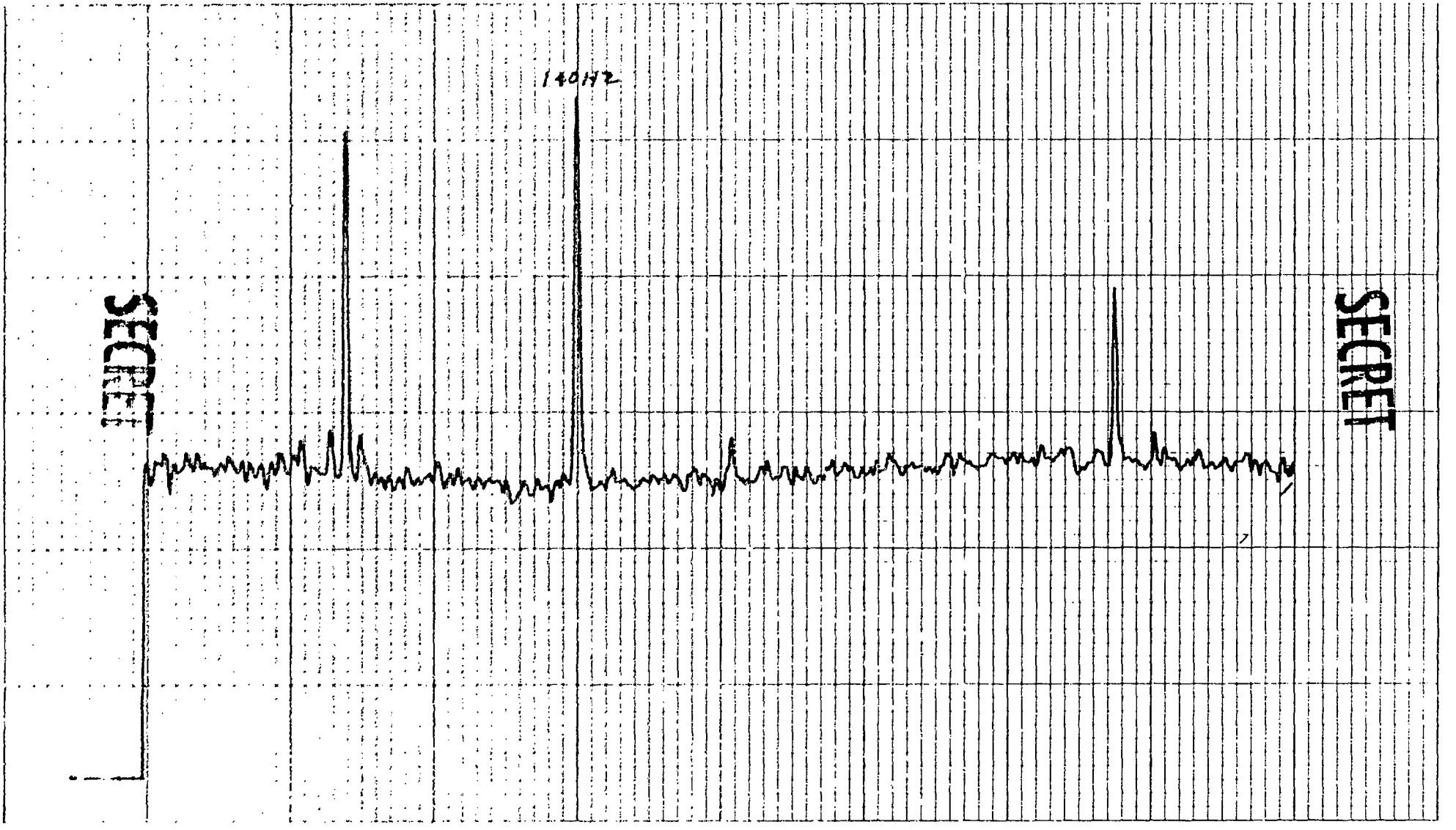


46 0703

CONTROL: 345 - 1501 (27)
OMNI SPECTRUM (ELEMENT 2)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 345-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 114 INDEX 3340
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

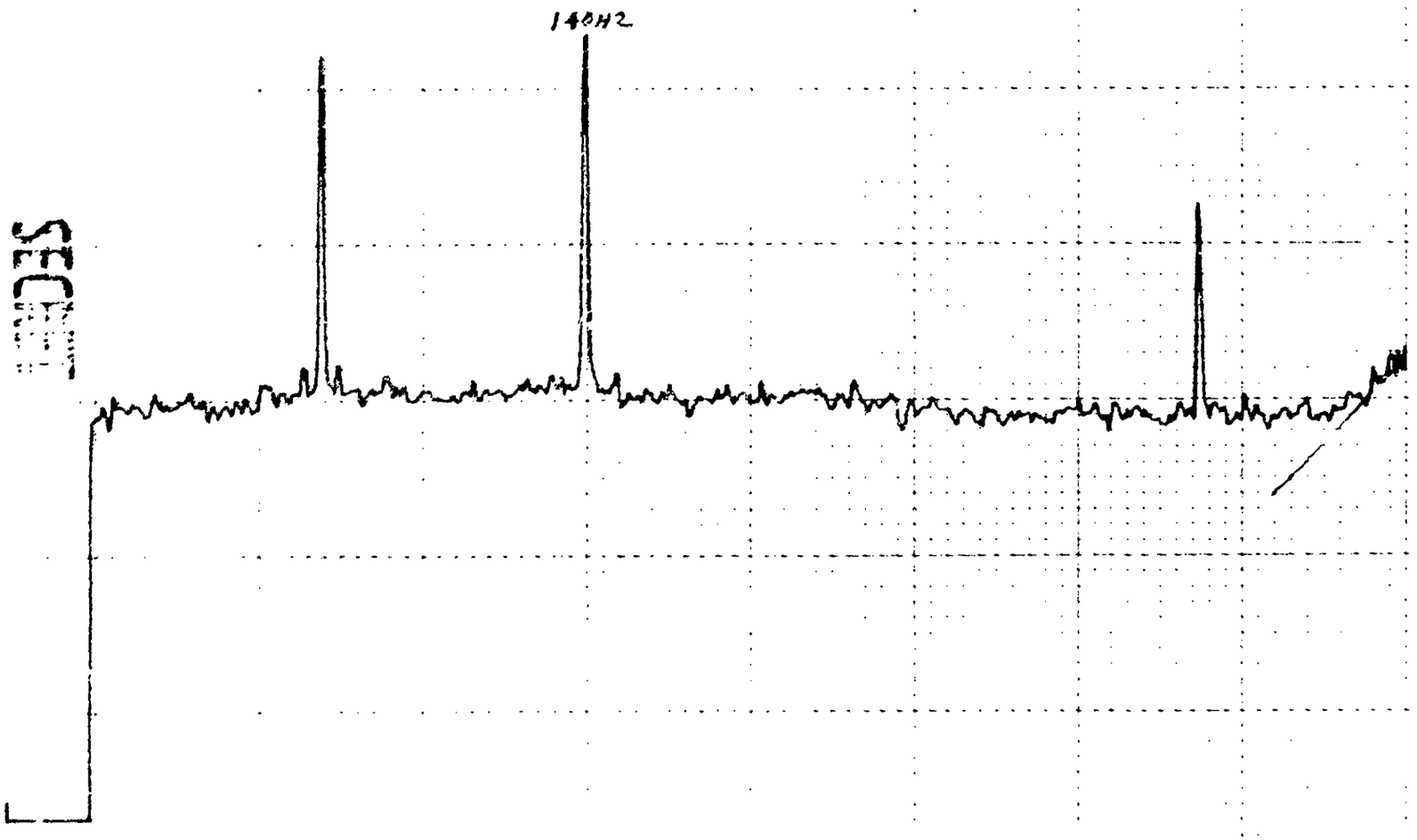


46 0703

CONTROL: 345-1501 (AB)
OMNI SPECTRUM (ELEMENT 4)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-5-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— — DEG AZ STEERING

REEL: M4 INDEX 3340
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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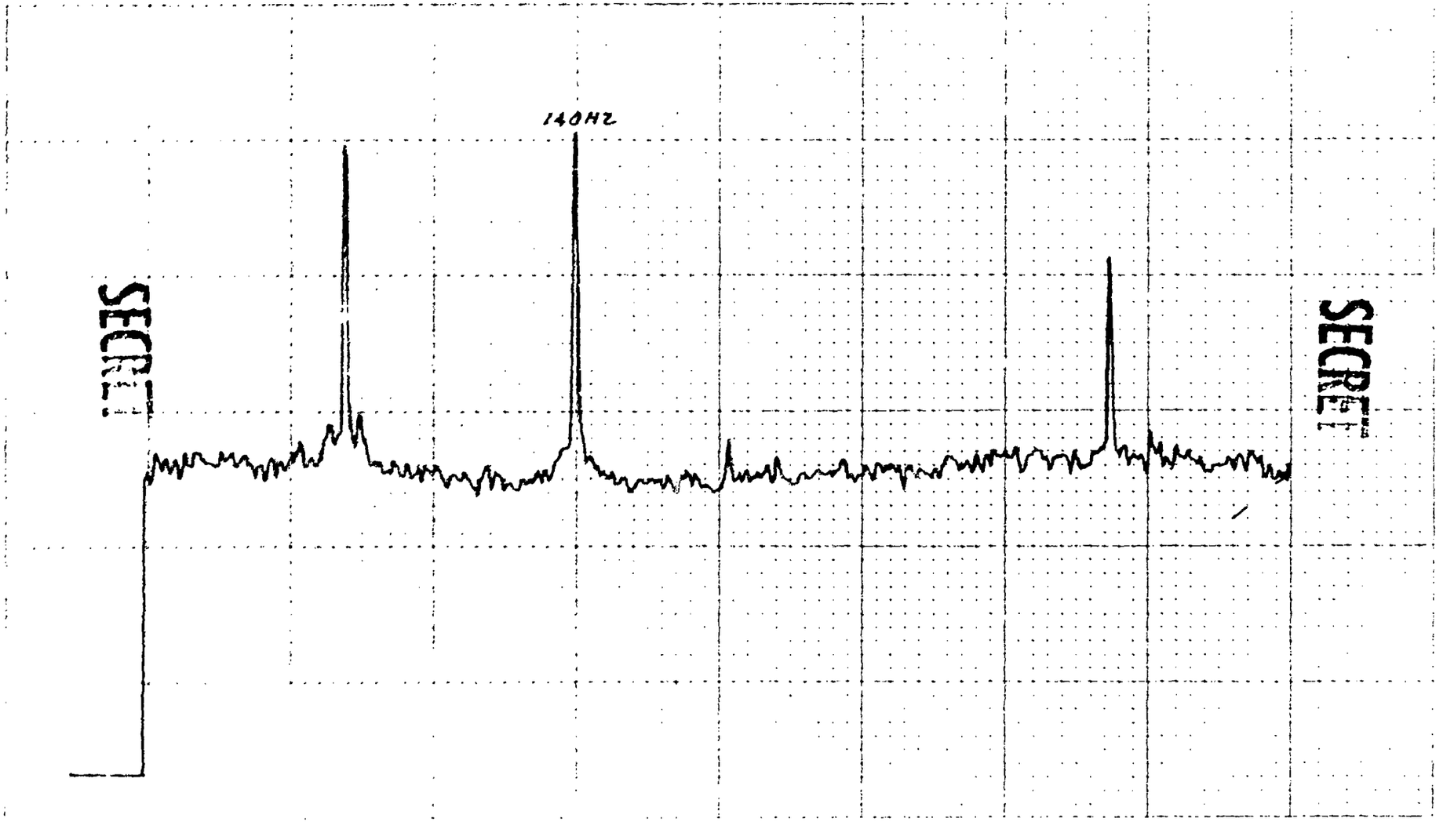
CONTROL: 3-15 -1501 (29)
OMNI SPECTRUM(ELEMENT 6)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3346

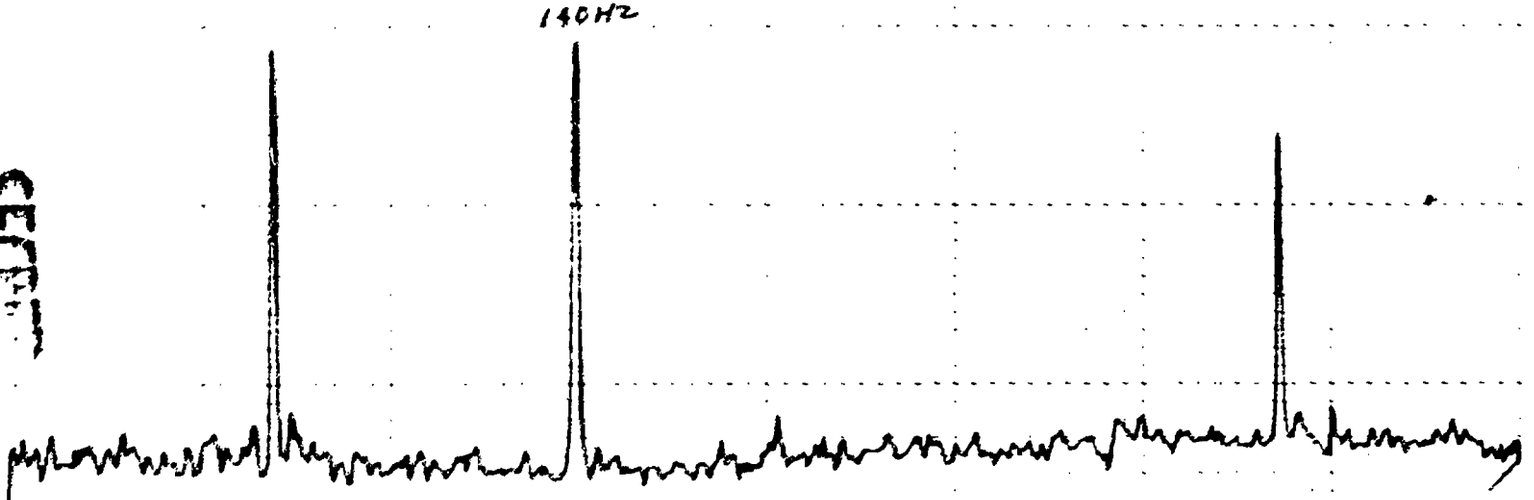
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



CONTROL: 305 -1501 130 /
OMNI SPECTRUM/ELEMENT 9 /
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATA OF ANALYSIS:
DATE/TIME: 24577 -1501 Z
ANALYSIS BANDWIDTH: 10HZ
— DEG AZ STEERING

PERL: M4 INDEX 3340
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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REEL: 114 INDEX 3000

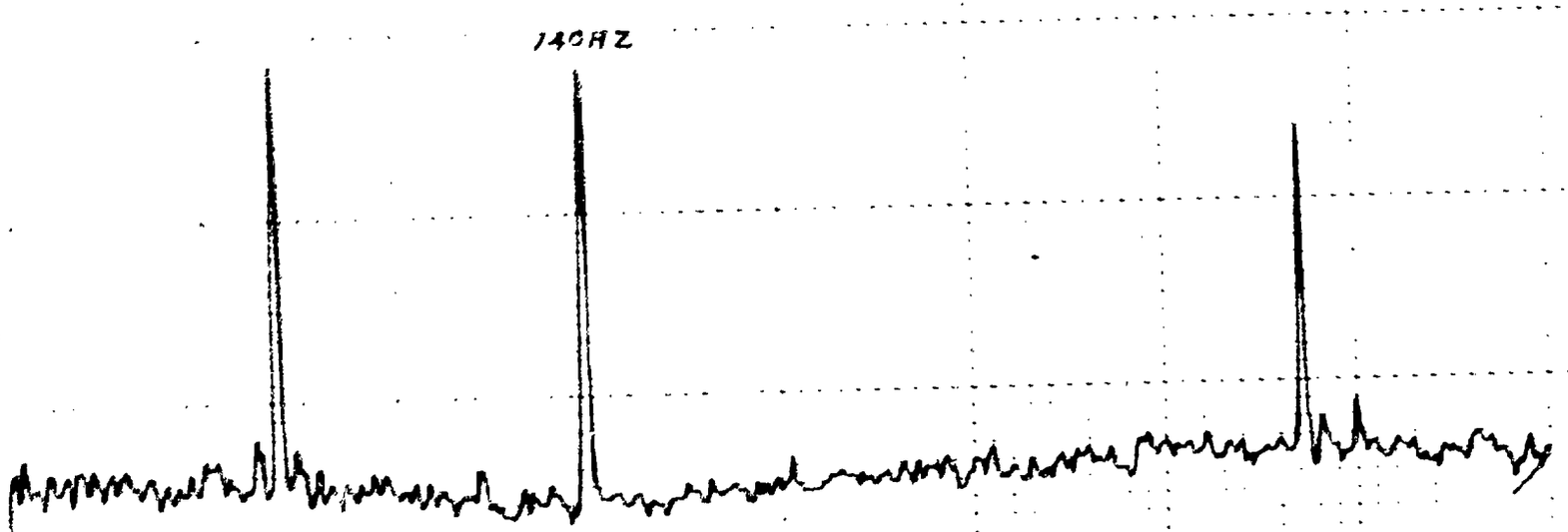
CONTROL: 1501 - 40 (DPB)
OMNI SPECTROM (ELEMENT 10)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
- DEG AZ STEERING

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING

SECRET



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46 0703

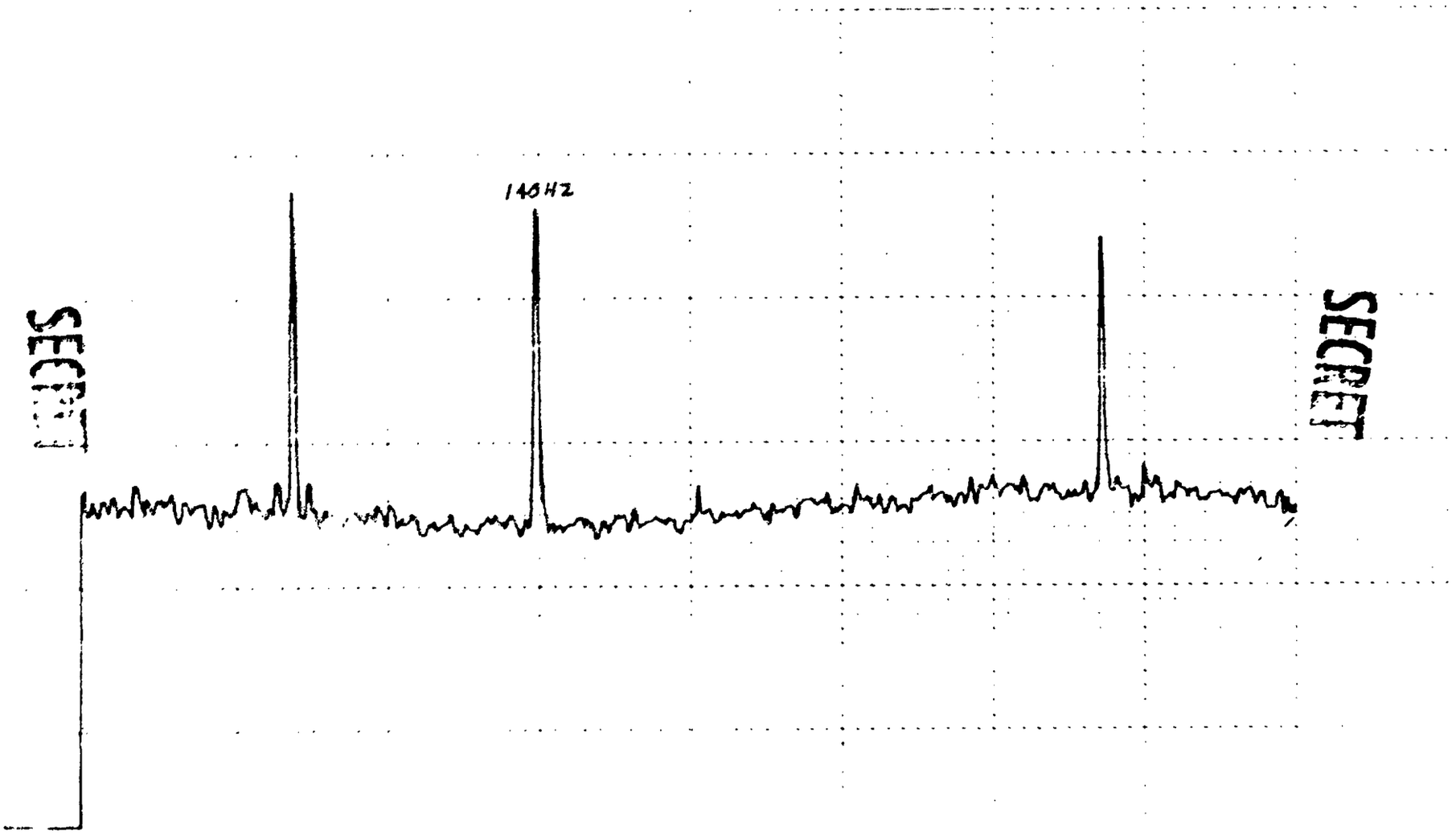
CONTROL: 345 - 1501 (72)
OMNI SPECTRUM(ELEMENT 12)
EXERCISE:BEARING STAPE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATA/TIME: 345-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: A4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

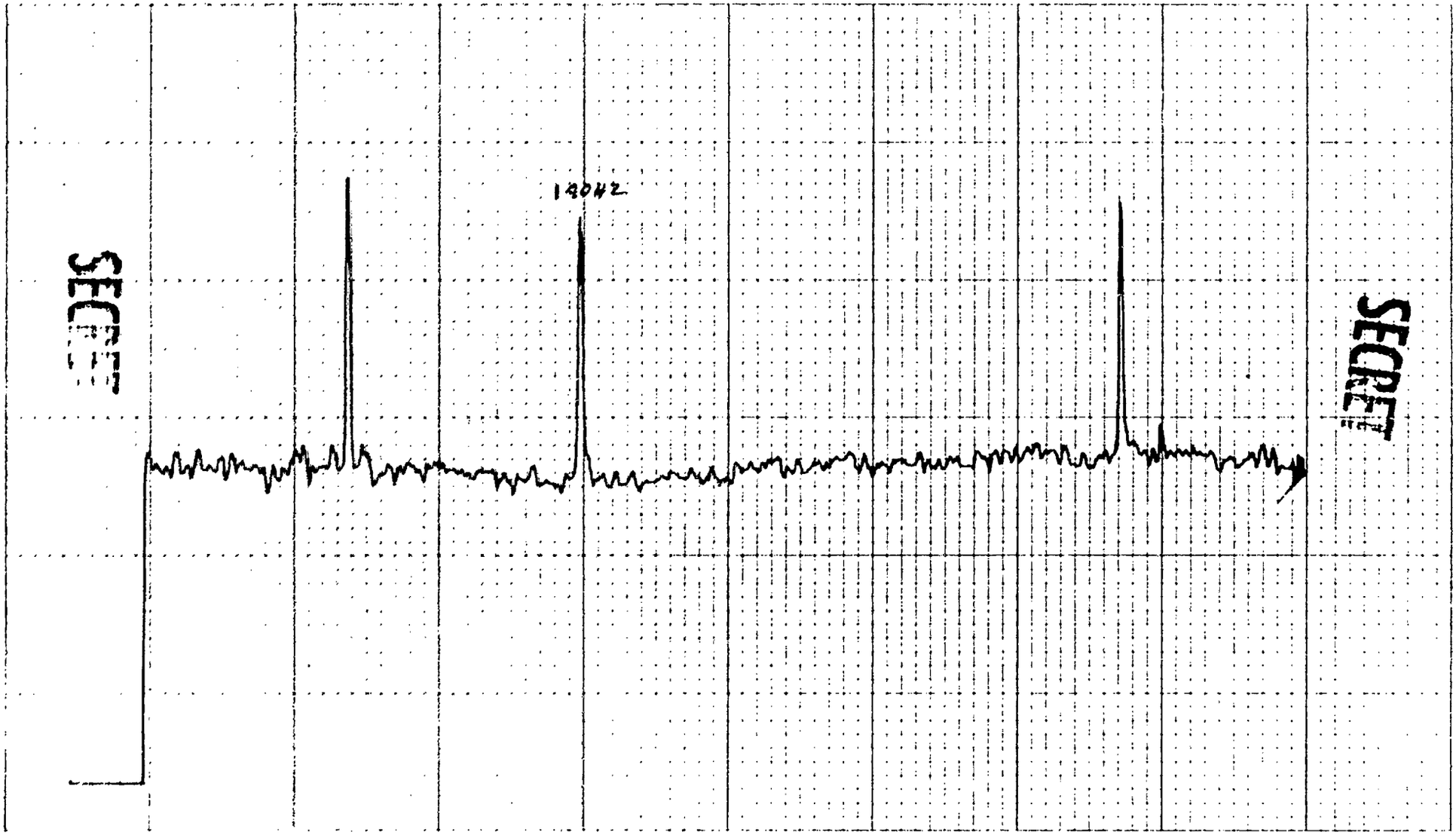
CONTROL: 3-15 - 1501 (33)
OMNI SPECTRUM (ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

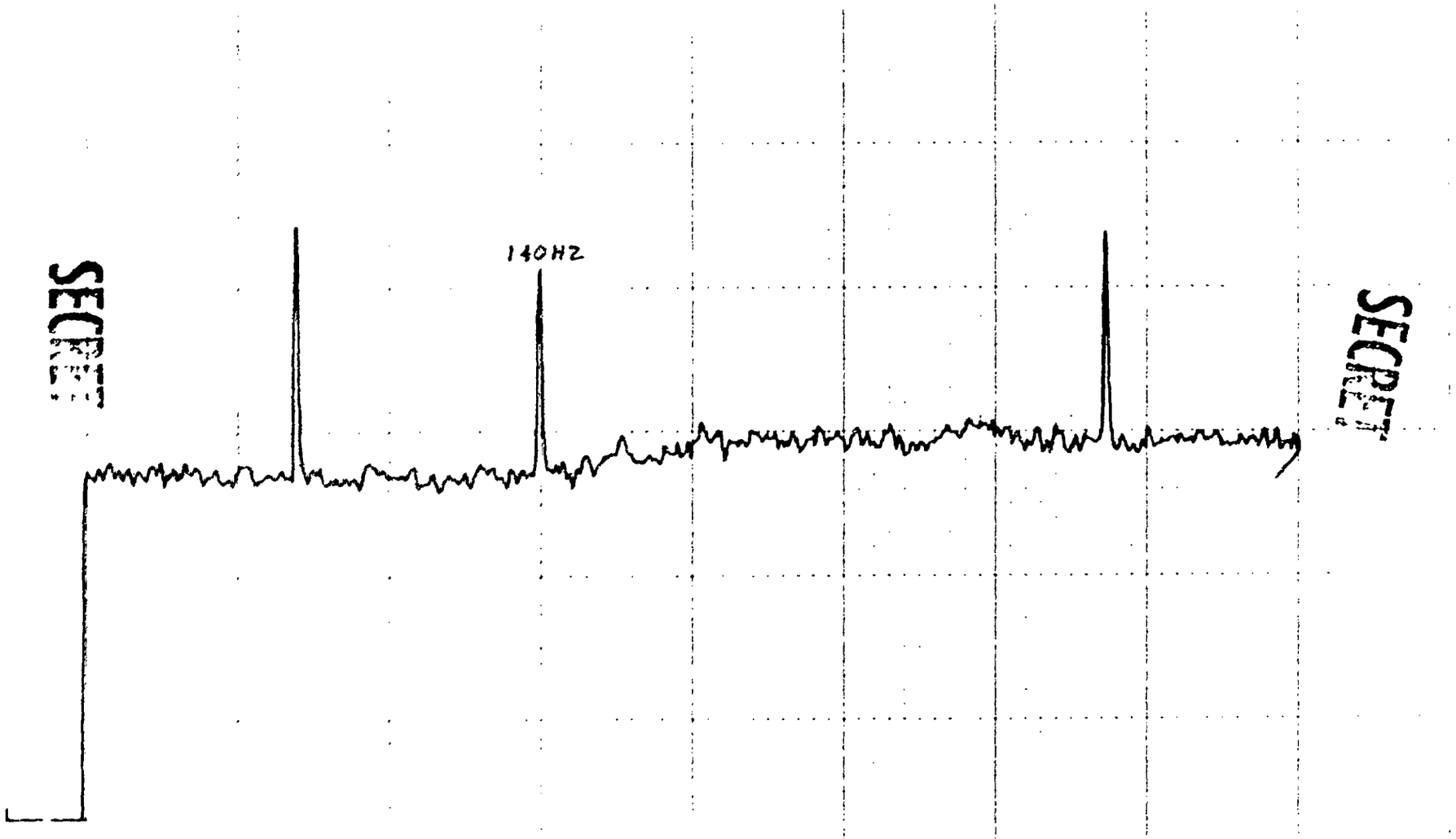
CONTROL: 345-1501 (34)
OMNI SPECTRUM(ELEMENT 16)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE O ANALYSIS:

DATE/T E: 345-77 - 1501 Z
ANALYS BANDWIDTH: 1/10HZ
DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING



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46 0703

CONTROL: 345-1501 (35)
OMNI SPECTRUM(ELEMENT 19)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

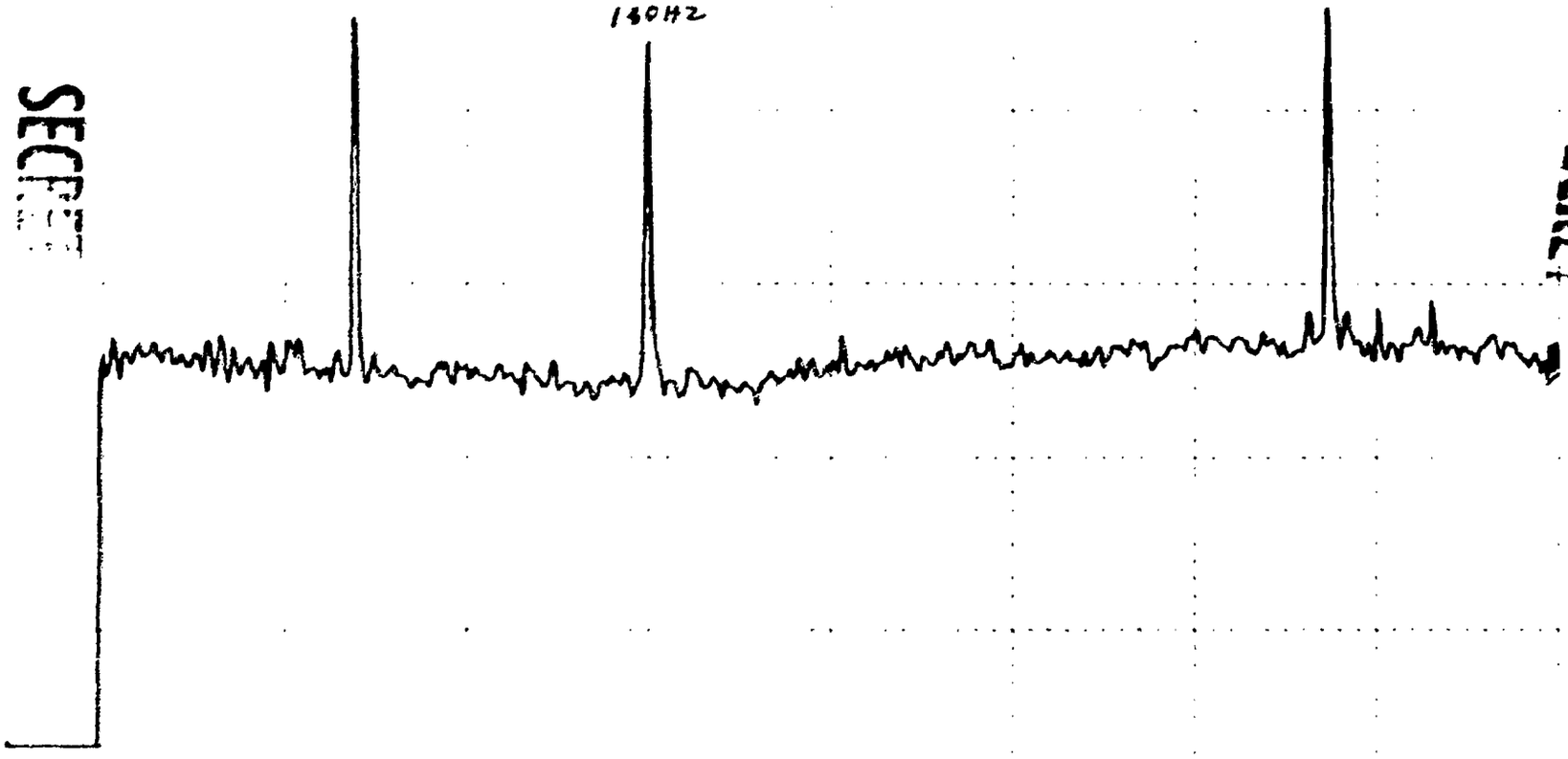
DATE OF ANALYSIS:

DATE/TIME: 345-77-1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

INTEGRATION TIME 320 SECS

REEL: M4 INDEX 3340

ATTEN: — DB
FILTER WTG: HANNING



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CONTROL: 3-15-1501 (26)
OMNI SPECTRUM(ELEMENT 20)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 114 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

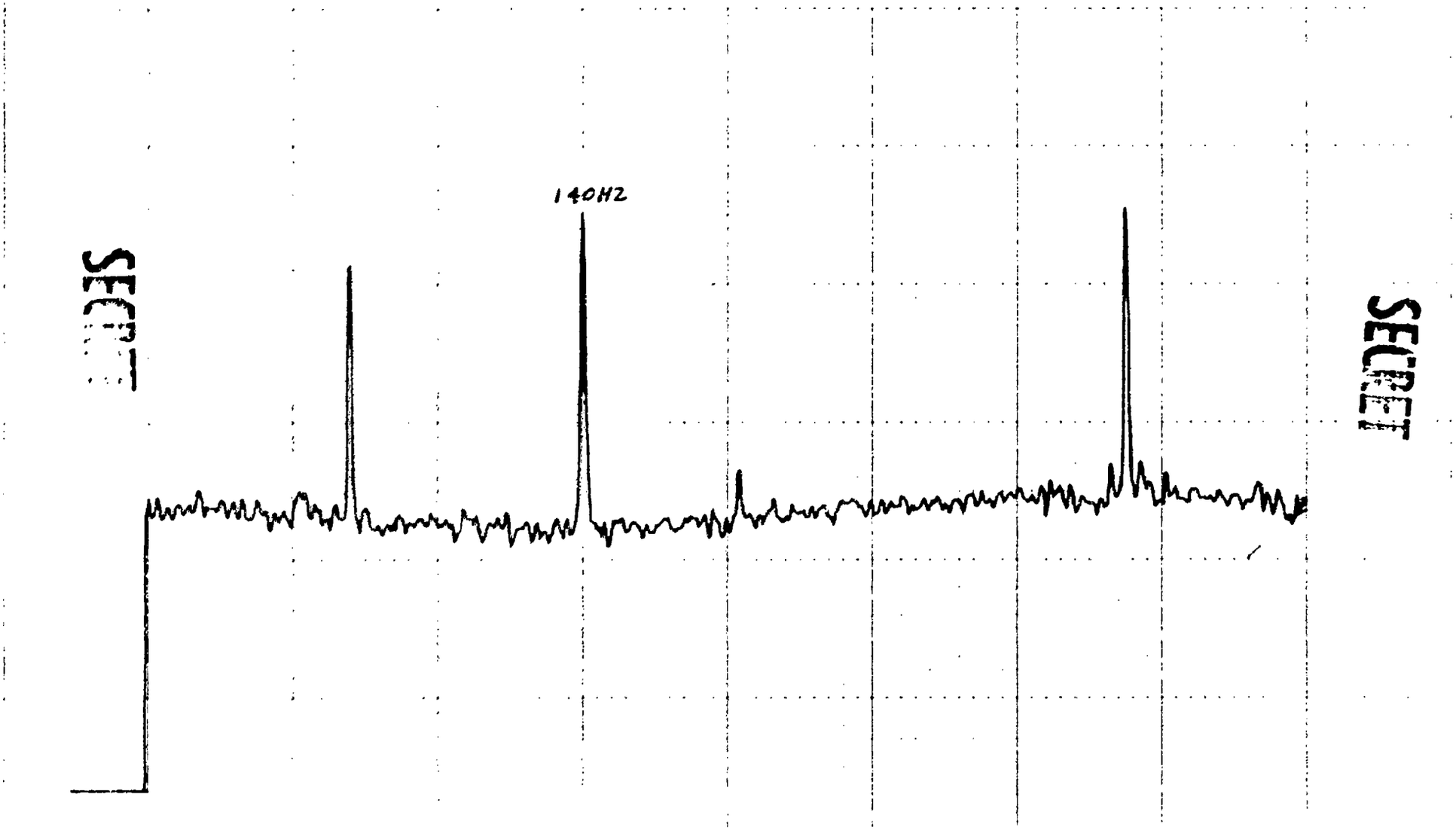
CONTROL: 3-15 - 1501 (37)
OMNI SPECTRUM(ELEMENT 23)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

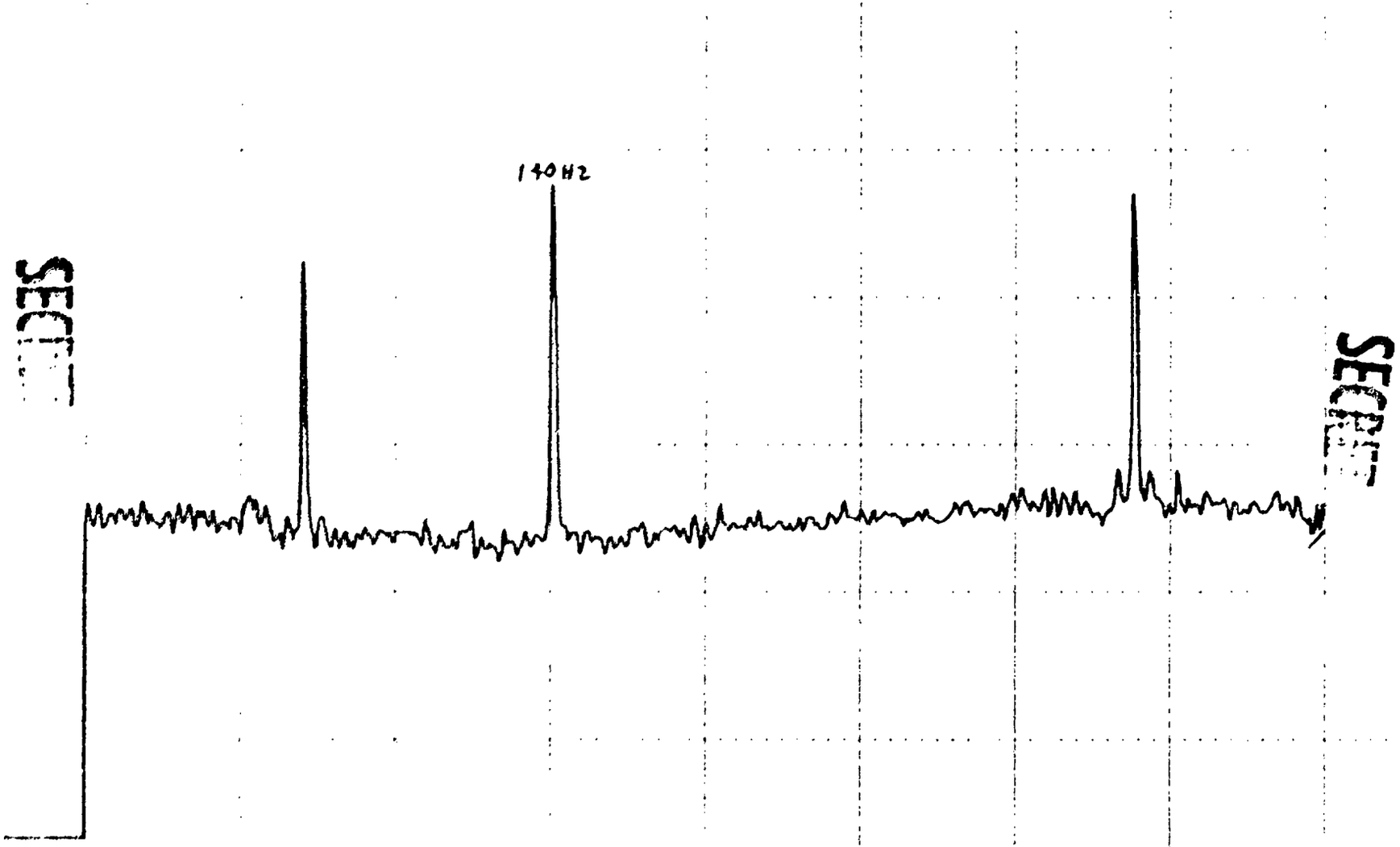
INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



CONTROL: 345 -1501 (78)
OMNI SPECTRUM(ELEMENT 24)
EXERCISE:BEARING STAEE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME:345-77 -1501 Z
ANALYSIS BANDWIDTH:1/10HZ
DEG AZ STEERING

REEL: M4 INDEX 7346
INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



46 0703

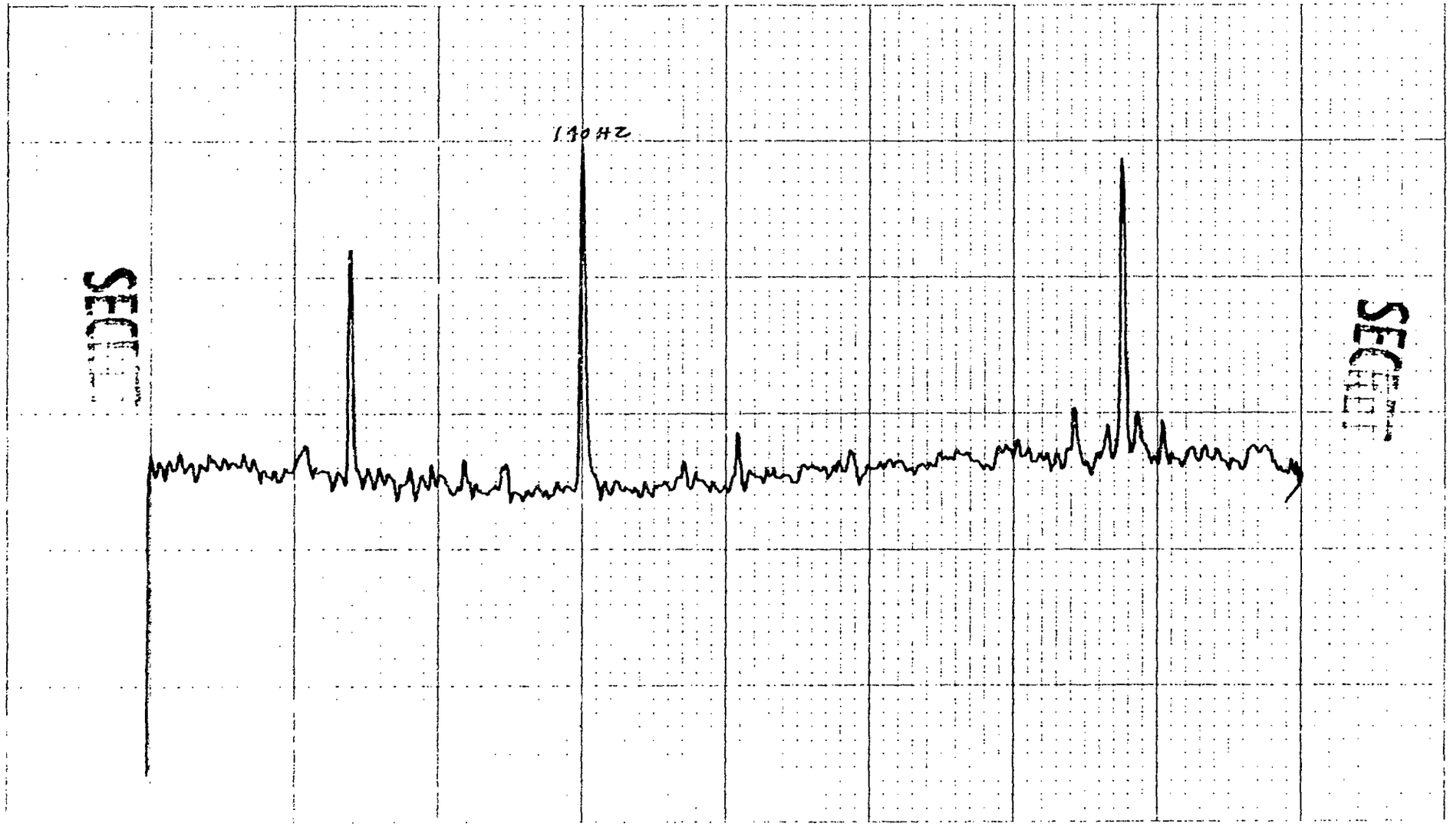
CONTROL: 3-15 -1501 (39)
OMNI SPECTRUM(ELEMENT 26)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



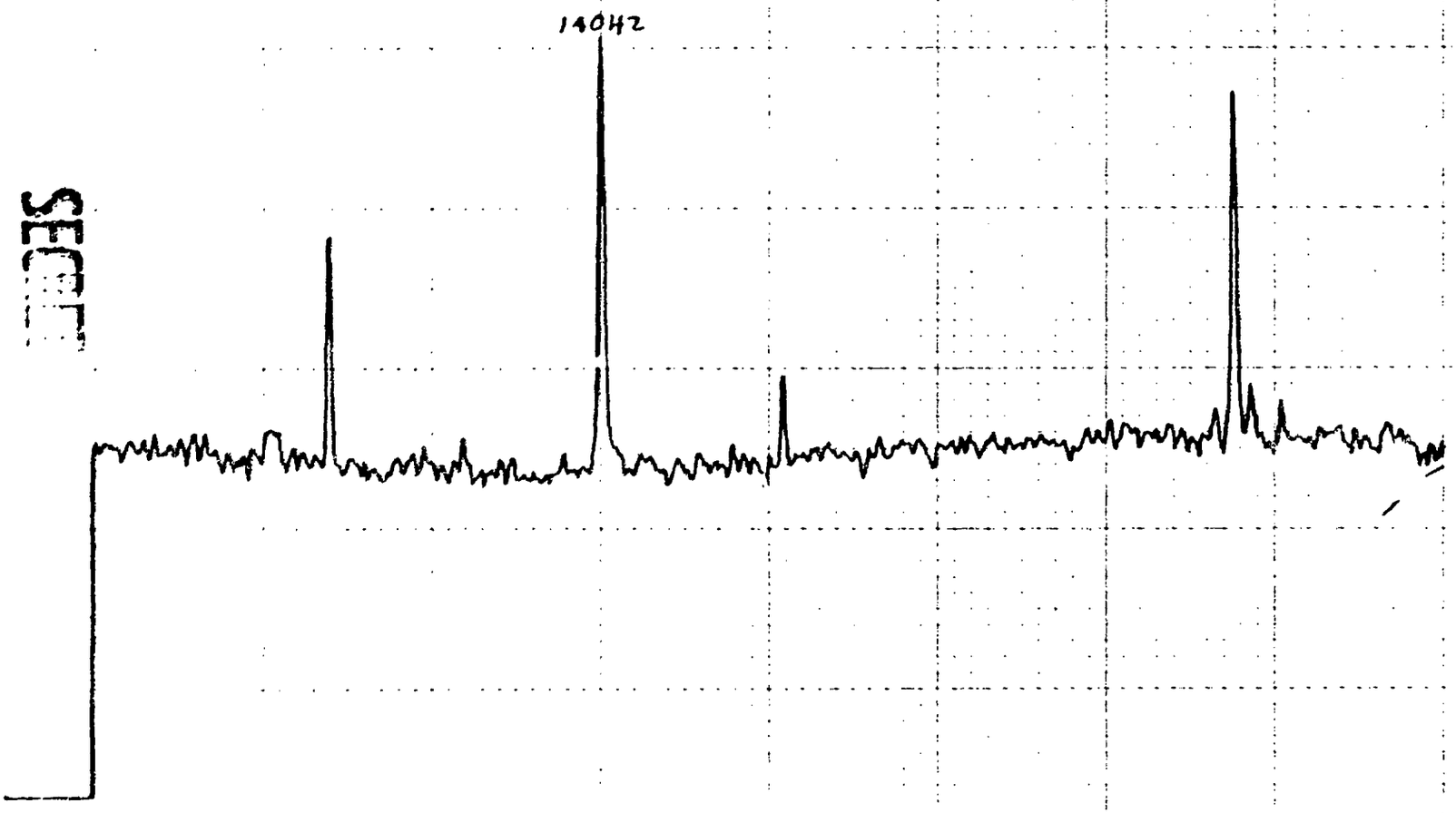
CONTROL: 3-15 - 1501 (40)
OMNI SPECTRUM(ELEMENT 29)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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46 0703

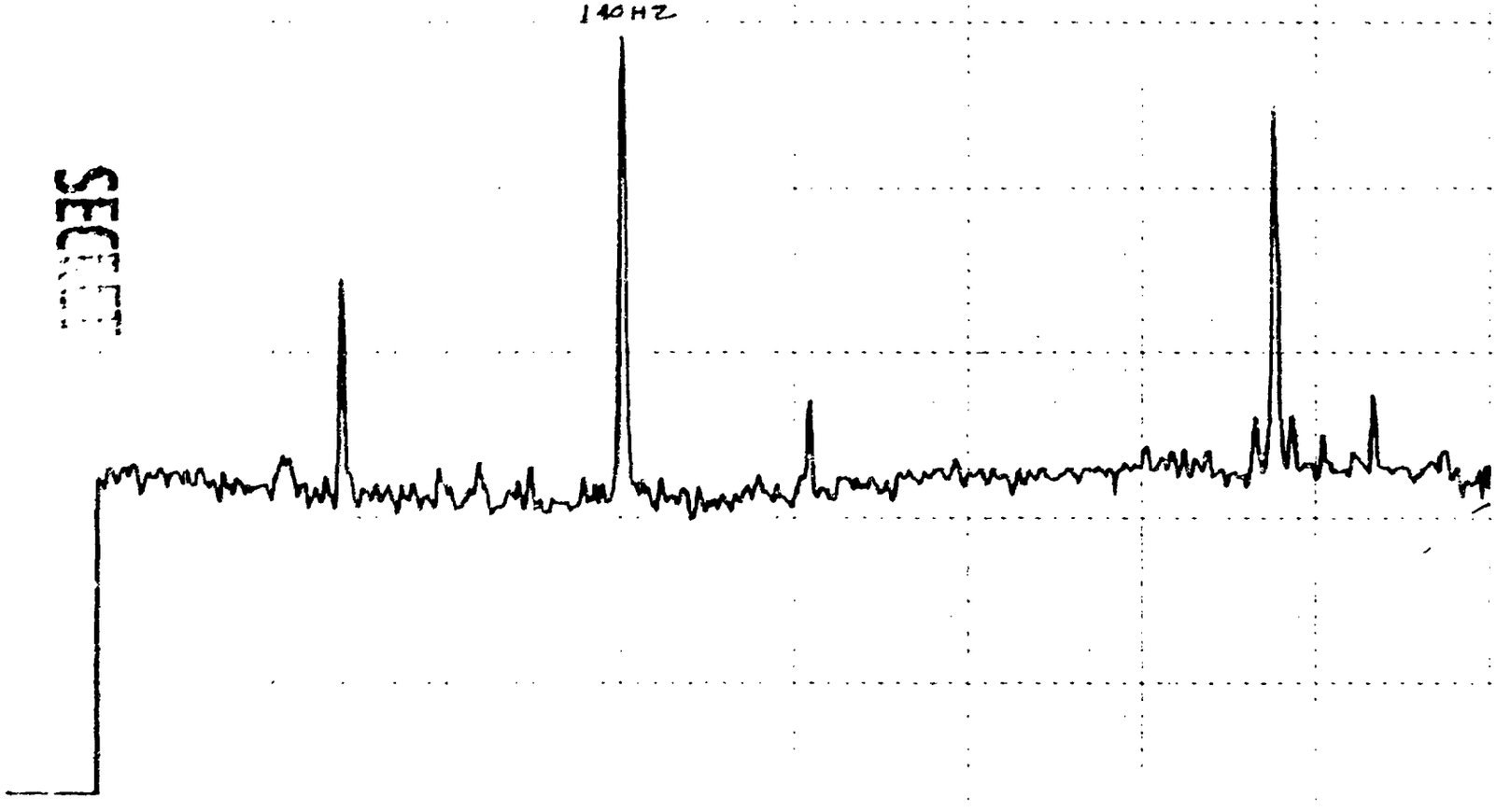
CONTROL: 375 - 1501 (41)
OMNI SPECTRUM(ELEMENT 31)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



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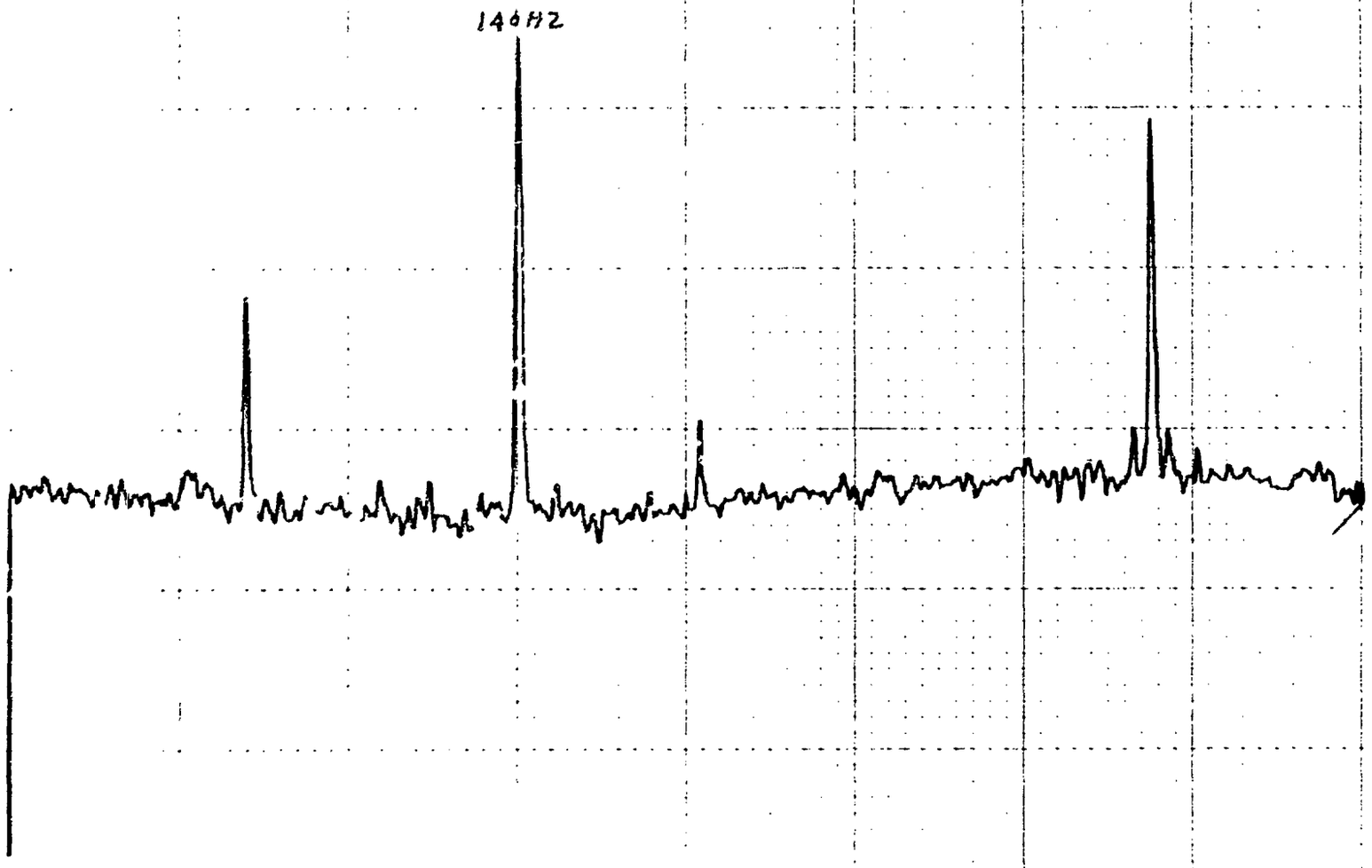
CONTROL: 3-15 - 1501 (42)
OMNI SPECTRUM(ELEMENT 33)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

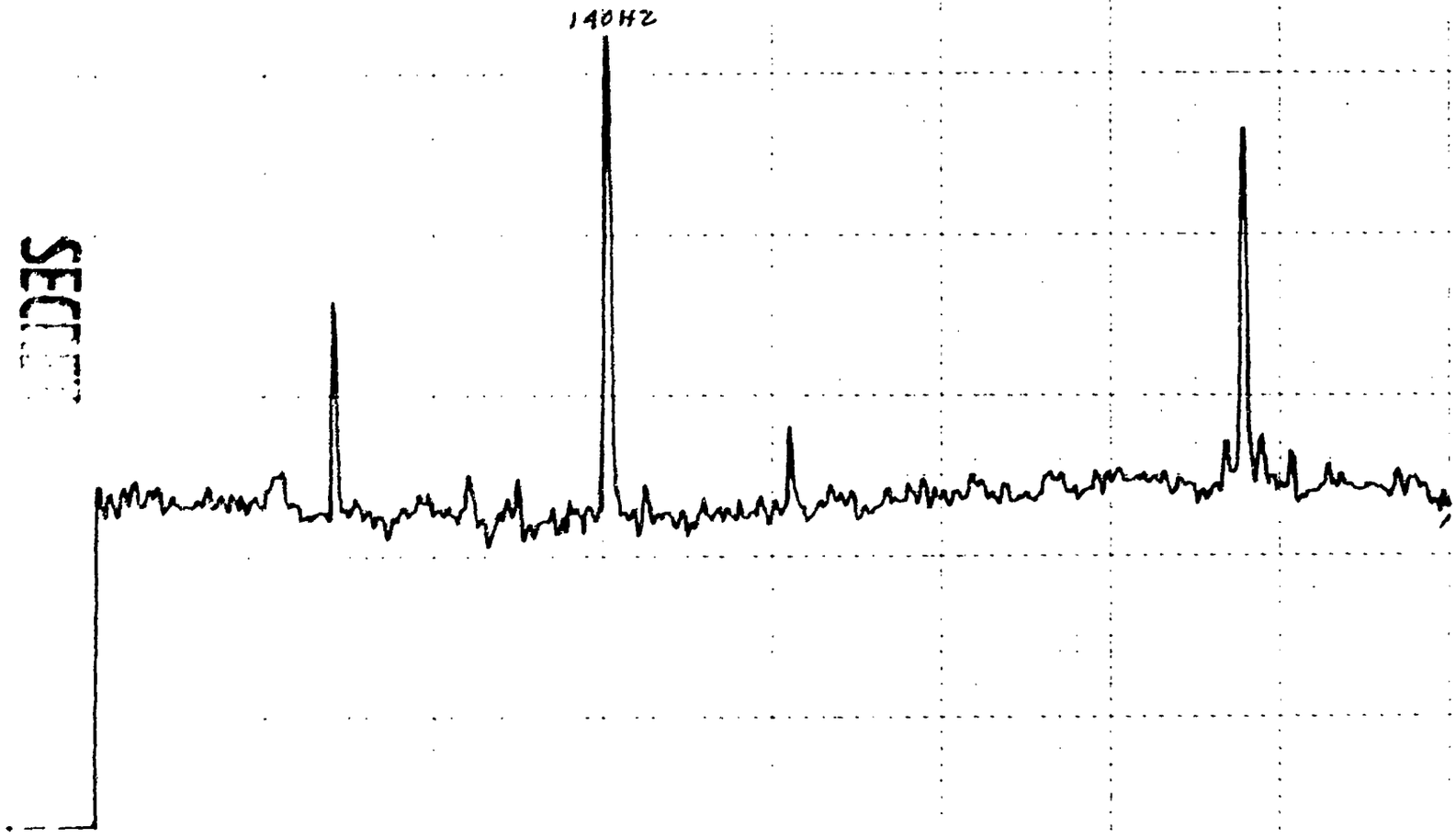
CONTROL: 345 - 1501 (43)
OMNI SPECTRUM(ELEMENT 35)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
——— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

SECRET

46 0703

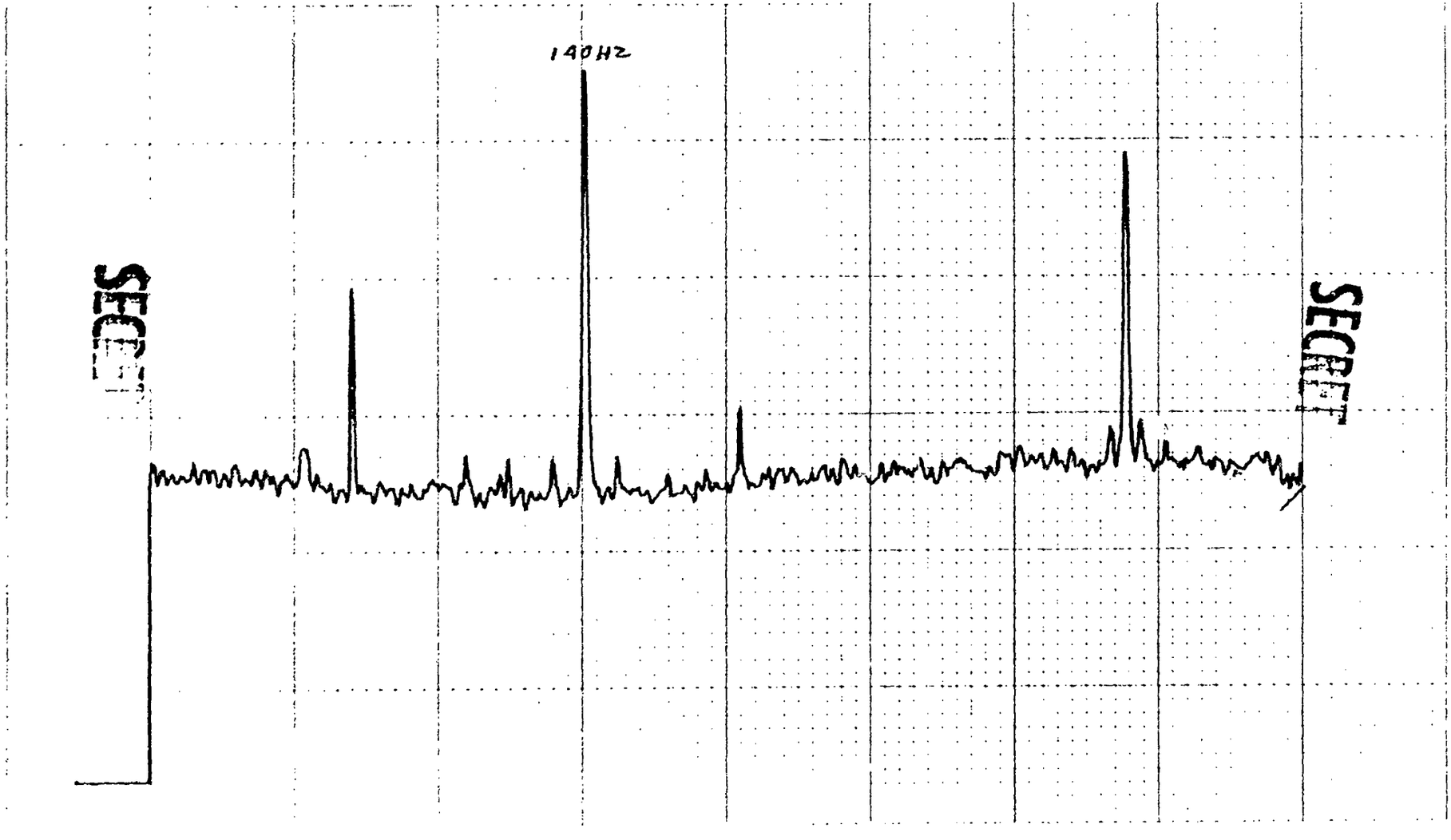
CONTROL: 3-15 - 1501 (44)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

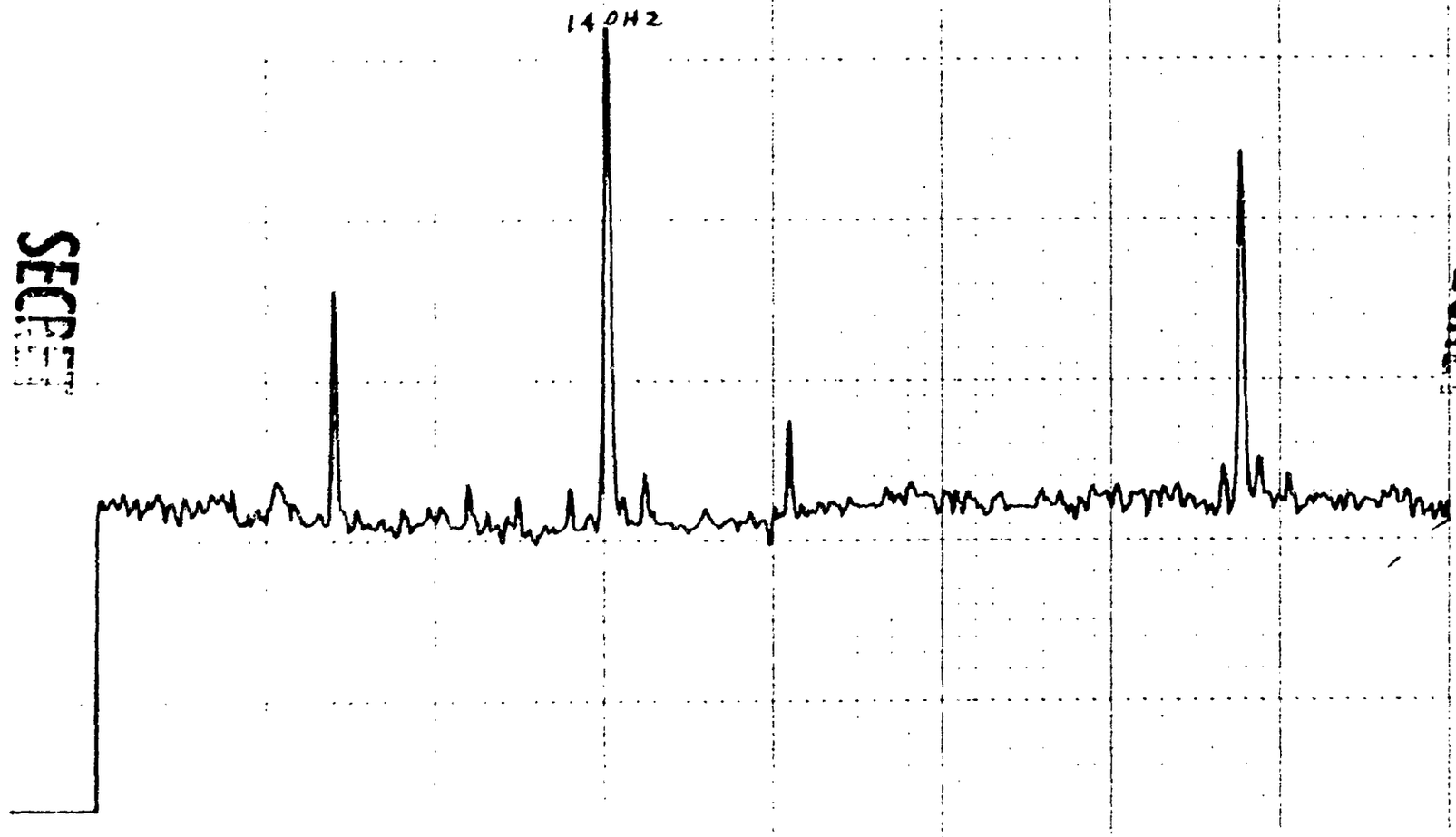
CONTROL: 3-15 - 1501 (45)
OMNI SPECTRUM (ELEMENT 39)
EXERCISE: BEARING STAKE
CENTER FREQ 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

SECRET

46 0703

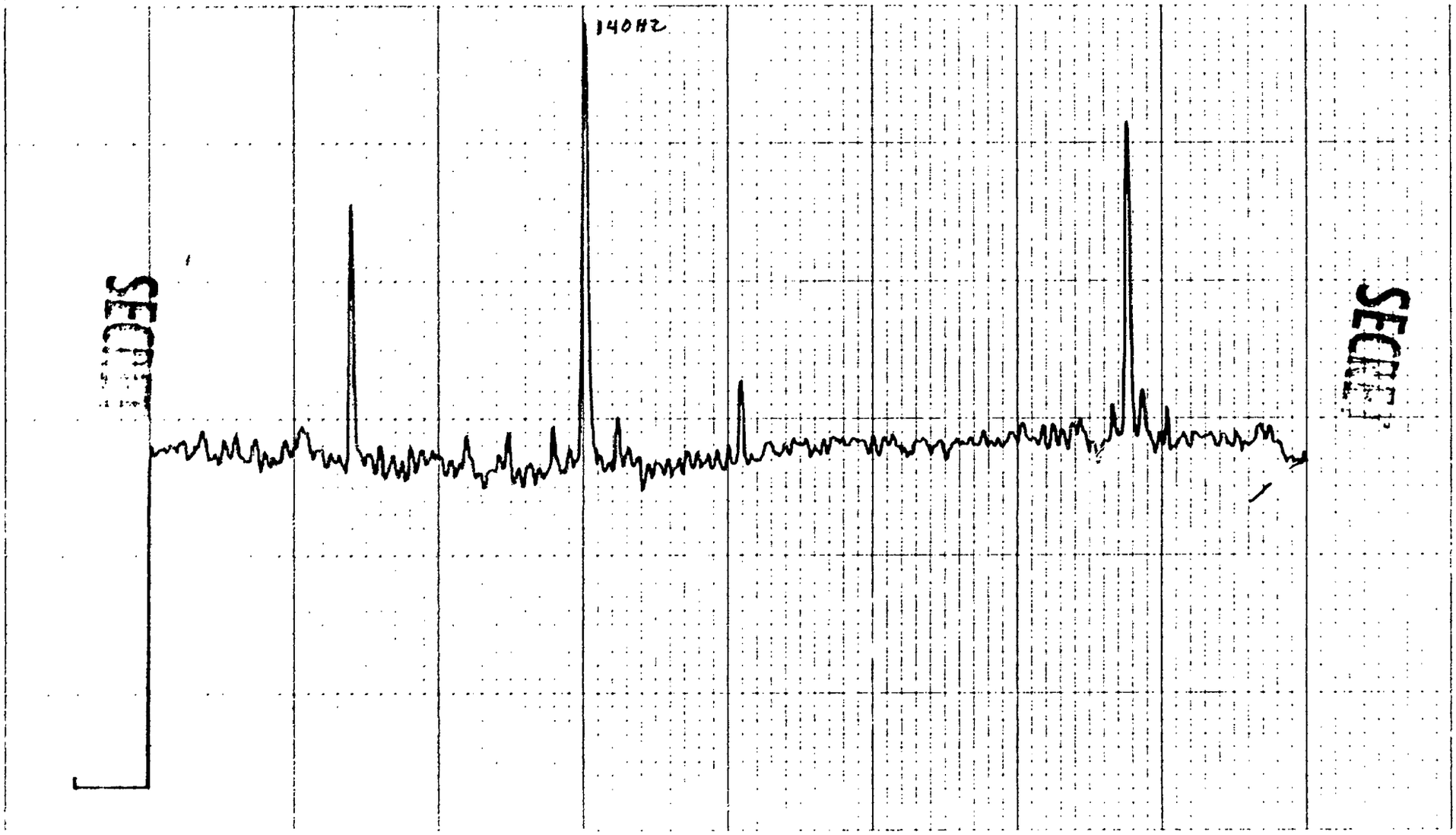
CONTROL: 3-15-1501 (46)
OMNI SPECTRUM(ELEMENT 41)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

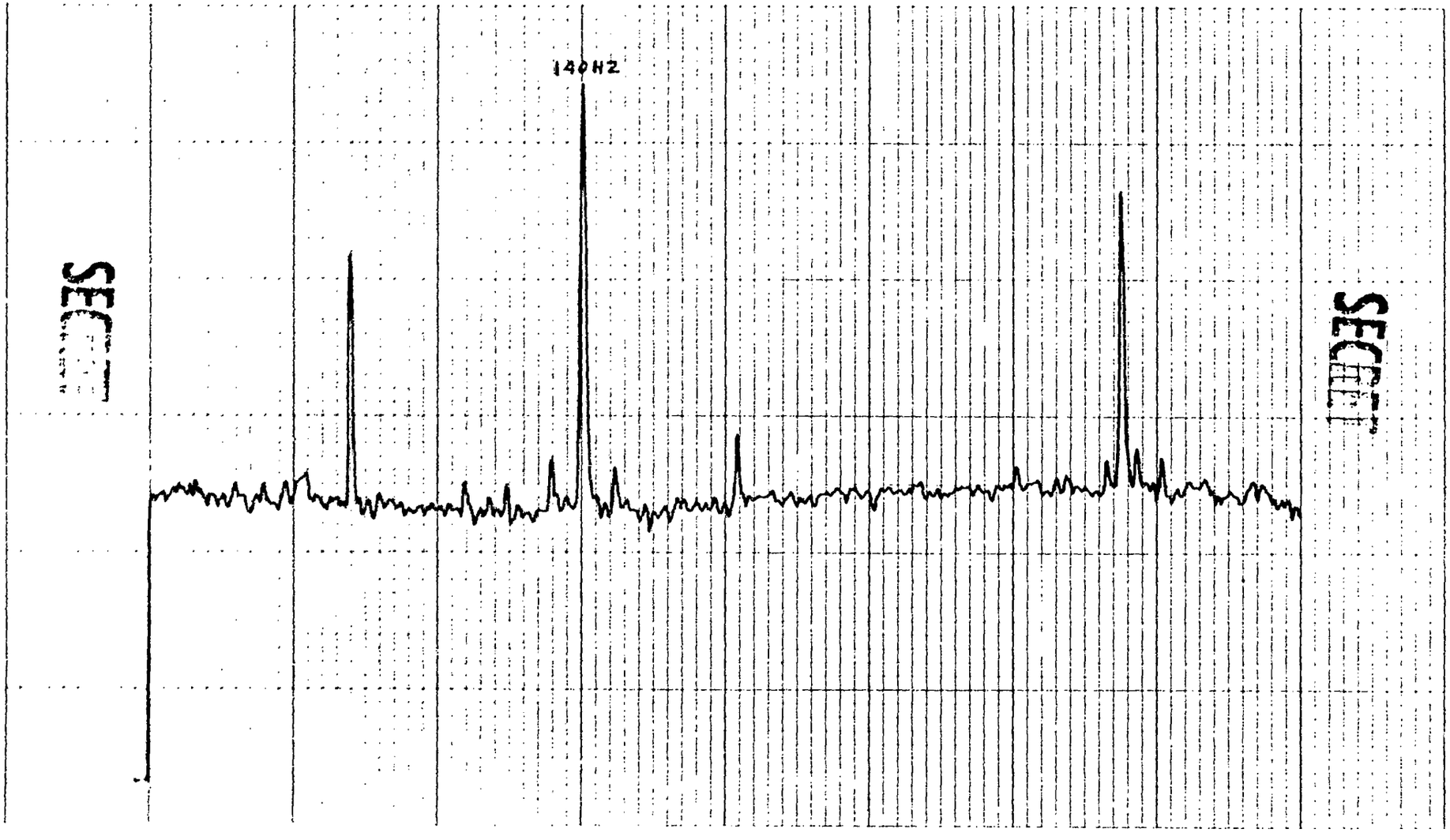
CONTROL: 3-15 -1501 (47)
OMNI SPECTRUM(ELEMENT 43)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



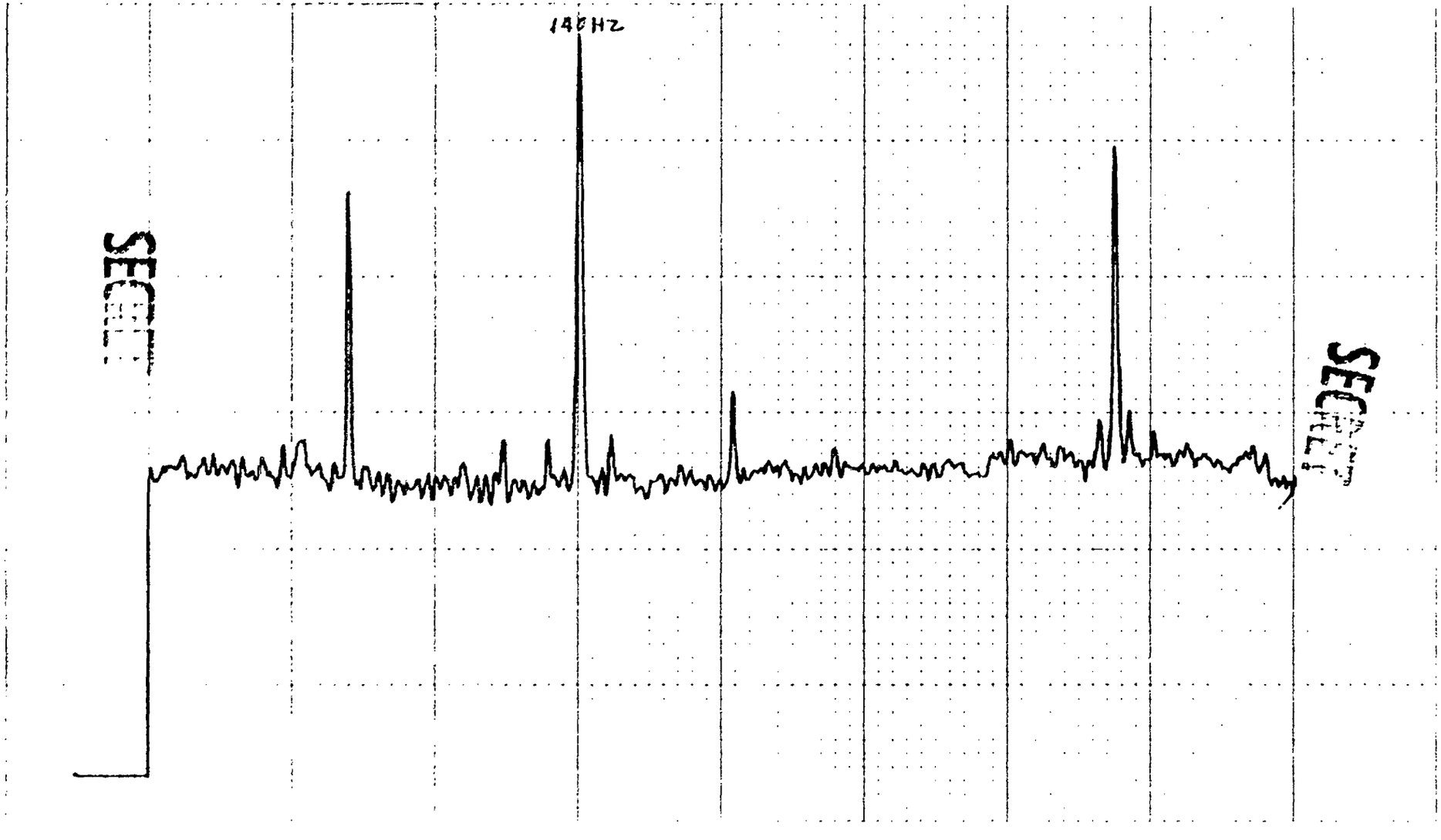
46 0703

CONTROL: 3-15 - 1501 (48)
OMNI SPECTRUM(ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: ~ DB
FILTER WTG: HANNING



46 0703

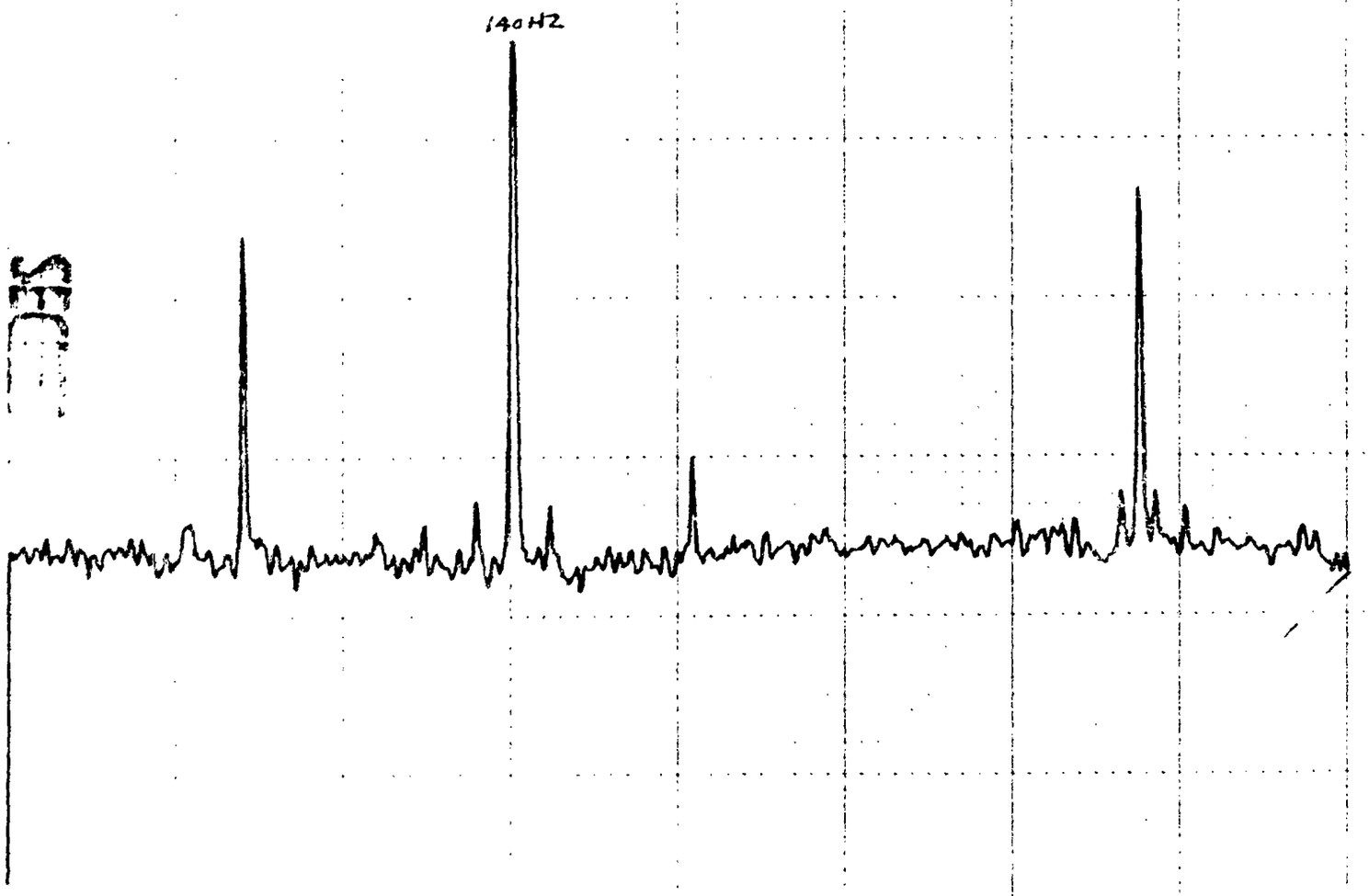
CONTROL: 3-15 - 1501 (49)
OMNI SPECTRUM (ELEMENT 47)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

SECRET

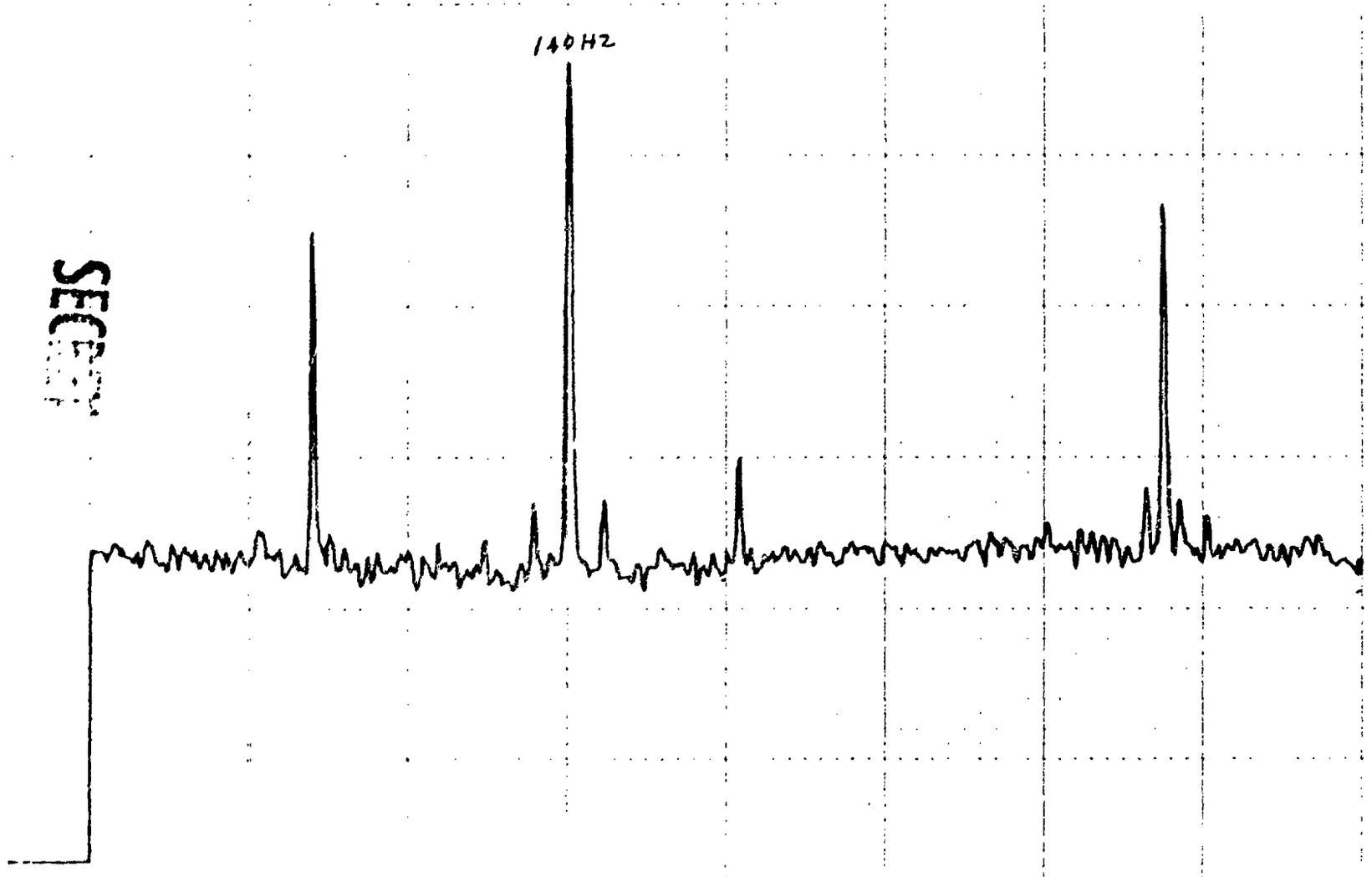
CONTROL: 3-15 -1501 (50)
OMNI SPECTRUM(ELEMENT 49)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

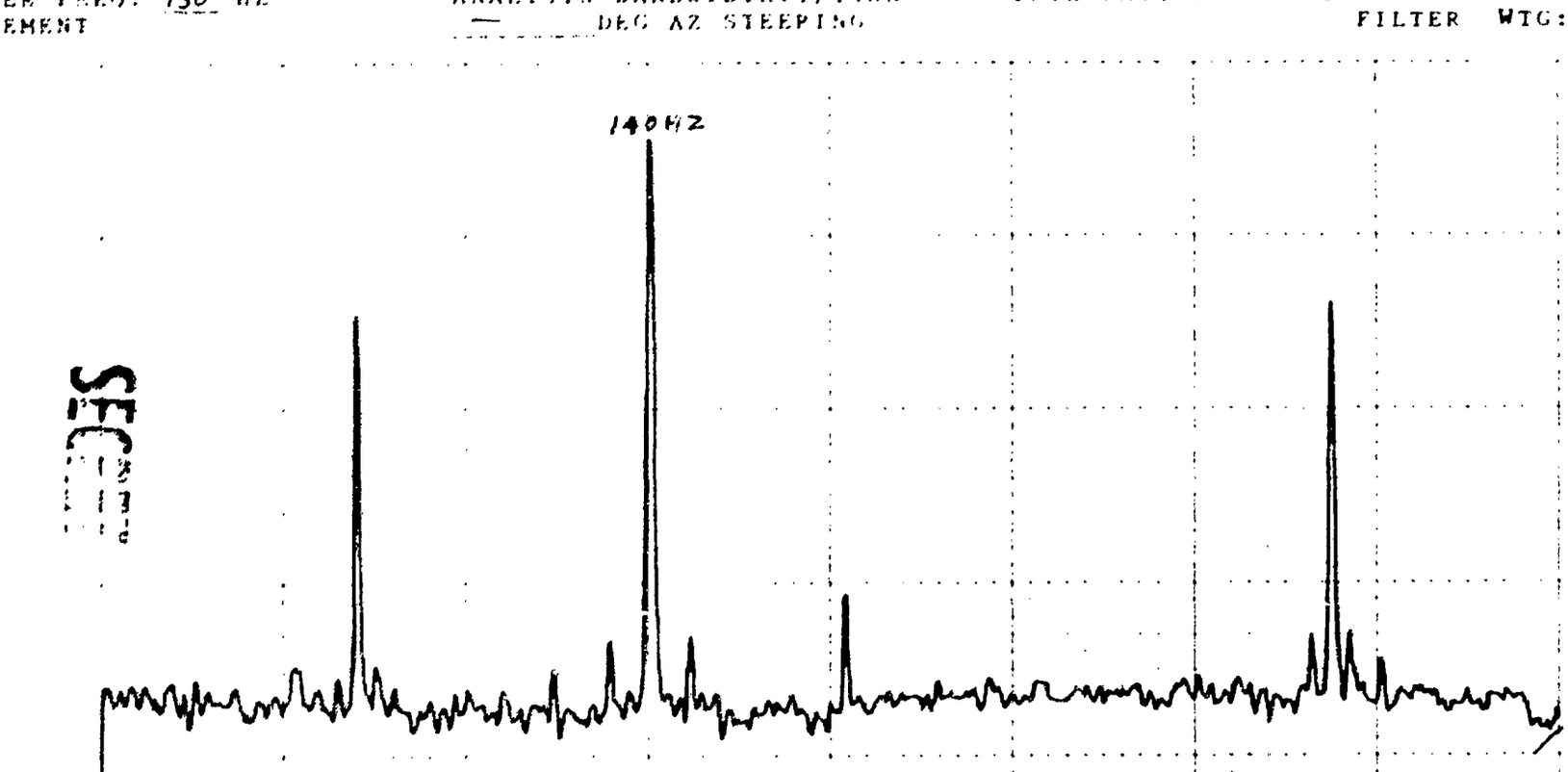
CONTROL: 3-15 -1501 (51)
OMNI SPECTRUM(ELEMENT 51)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

SECRET

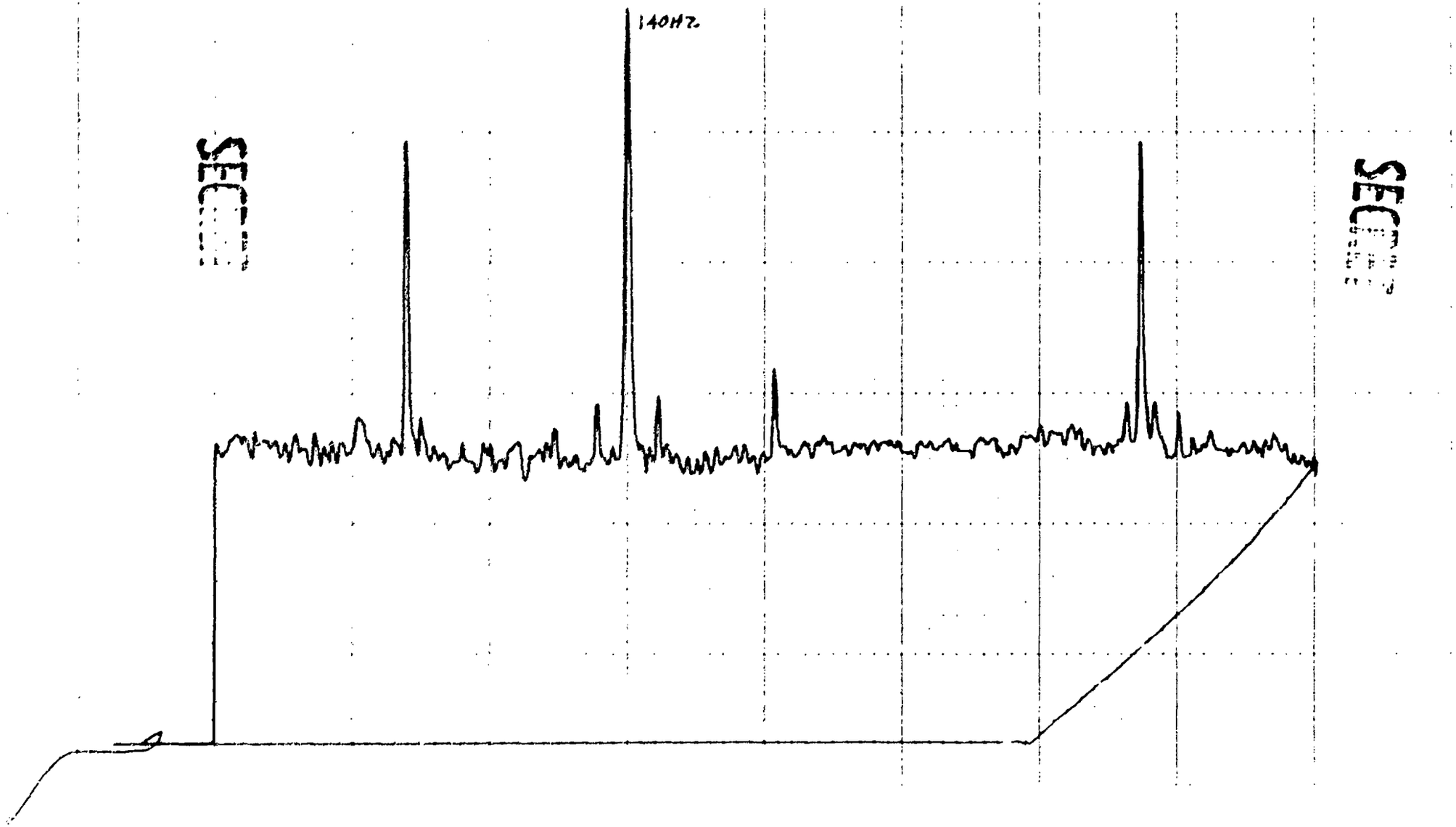
CONTROL: 3-15 - 1501 (52)
OMNI SPECTRUM(ELEMENT 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ ___DEG AZ STEERING

REEL: M4 INDEX 334

INTEGRATION TIME 320 SECS ATTEN: _ DB
FILTER WTG: HANNING



46 0703

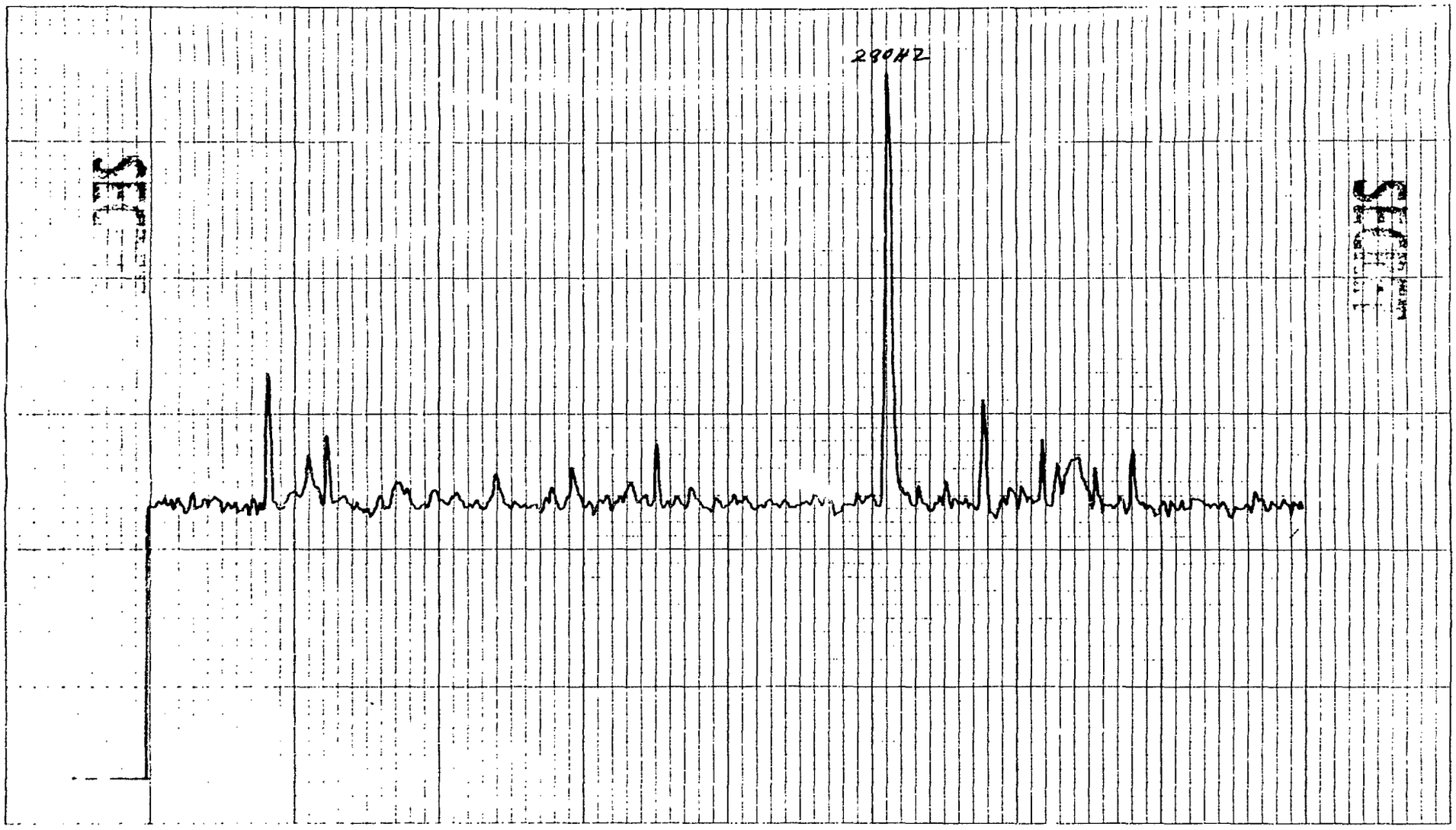
CONTROL: 3-15-1501 (i)
OMNI SPECTRUM(ELEMENT 2)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

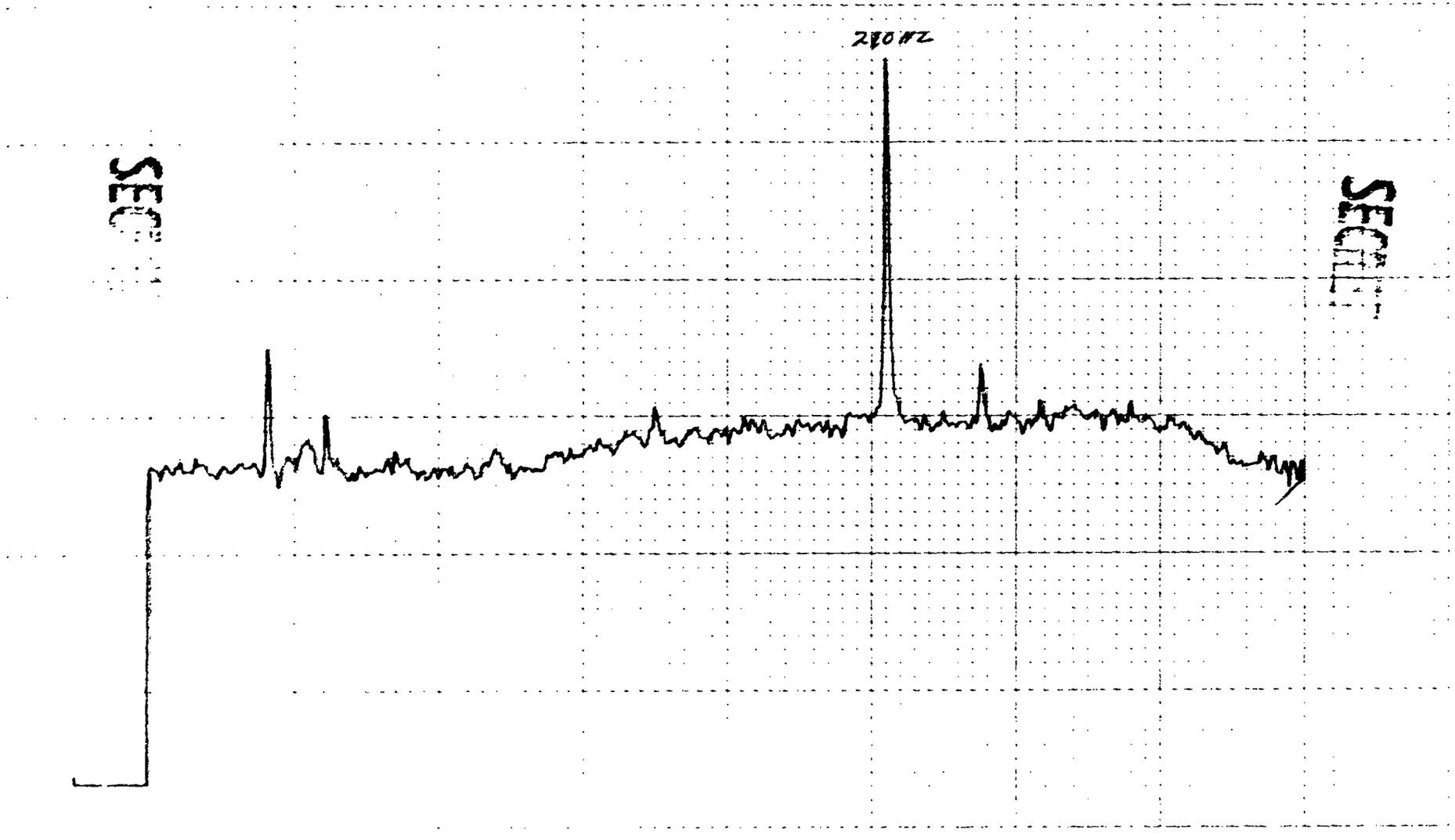
CONTROL: 375-1501 (2)
OMNI SPECTRUM(ELEMENT 4)
EXERCISE:BEAPING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 44 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

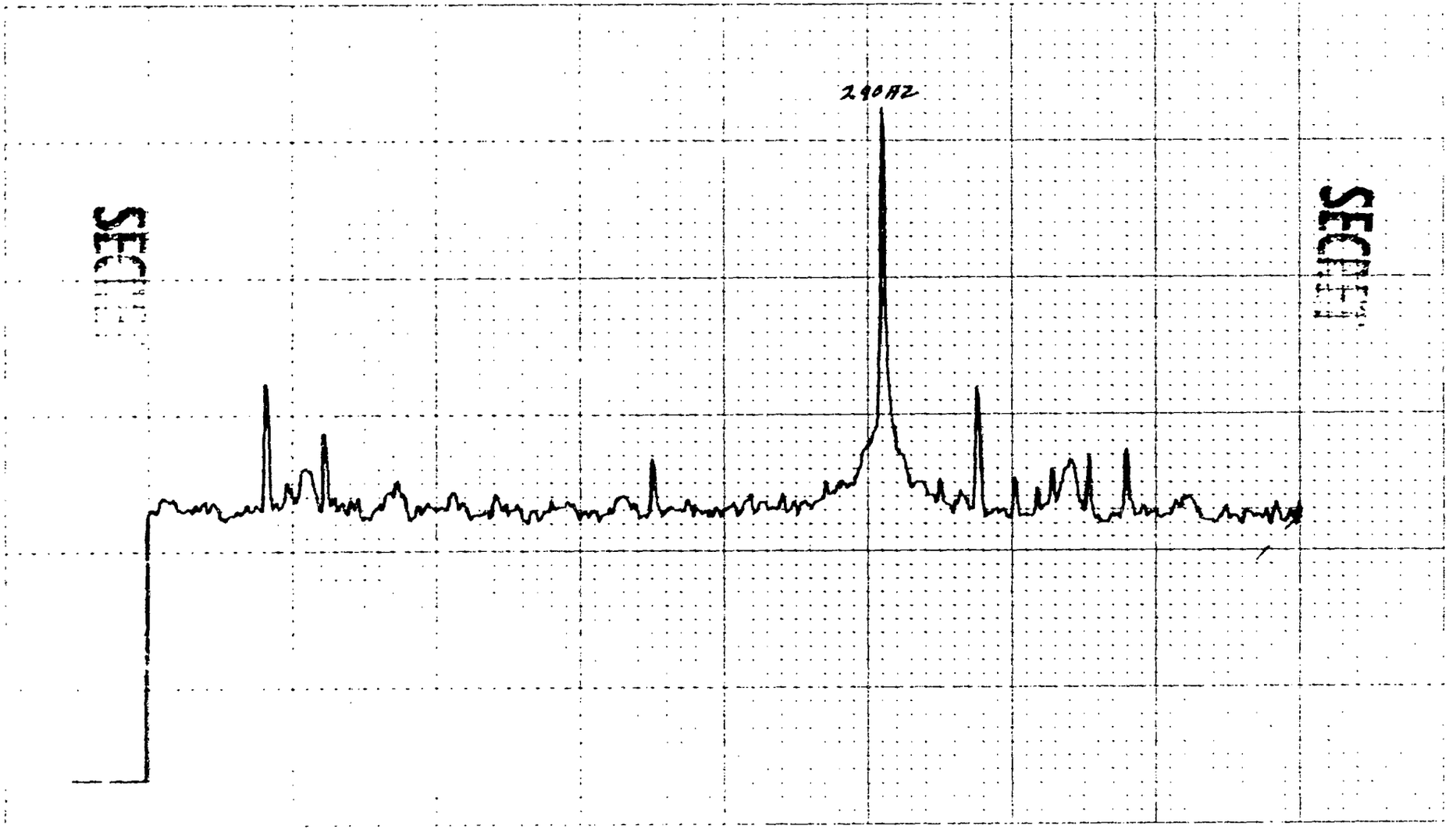
CONTROL: 3-15-1501 (3)
OMNI SPECTRUM (ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77-1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E

46 0703

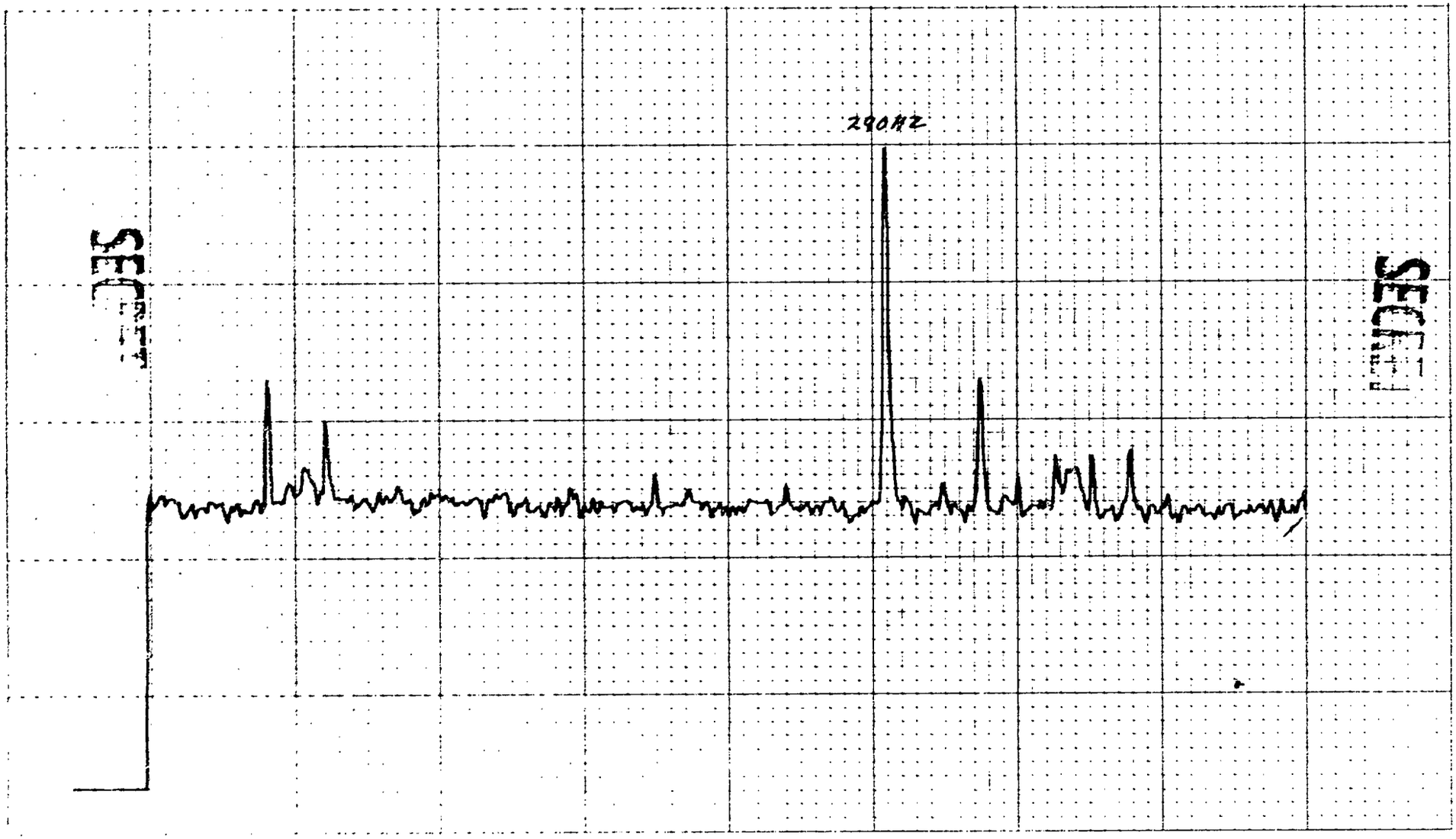
CONTROL: 3-15-1501 (4)
OMNI SPECTRUM(ELEMENT 9)
EXERCISE: BEARING STAKE
CENTER FREQ: 230 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH KEUFFEL & ESSER CO.

46 0703

CONTROL: 3-15-1501 (5)
OMNI SPECTRUM(ELEMENT 10)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH KEUFFEL & ESSER CO.

46 0703

CONTROL: 345 - 1501 (6)
OMNI SPECTRUM(ELEMENT 12)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 345-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: N4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

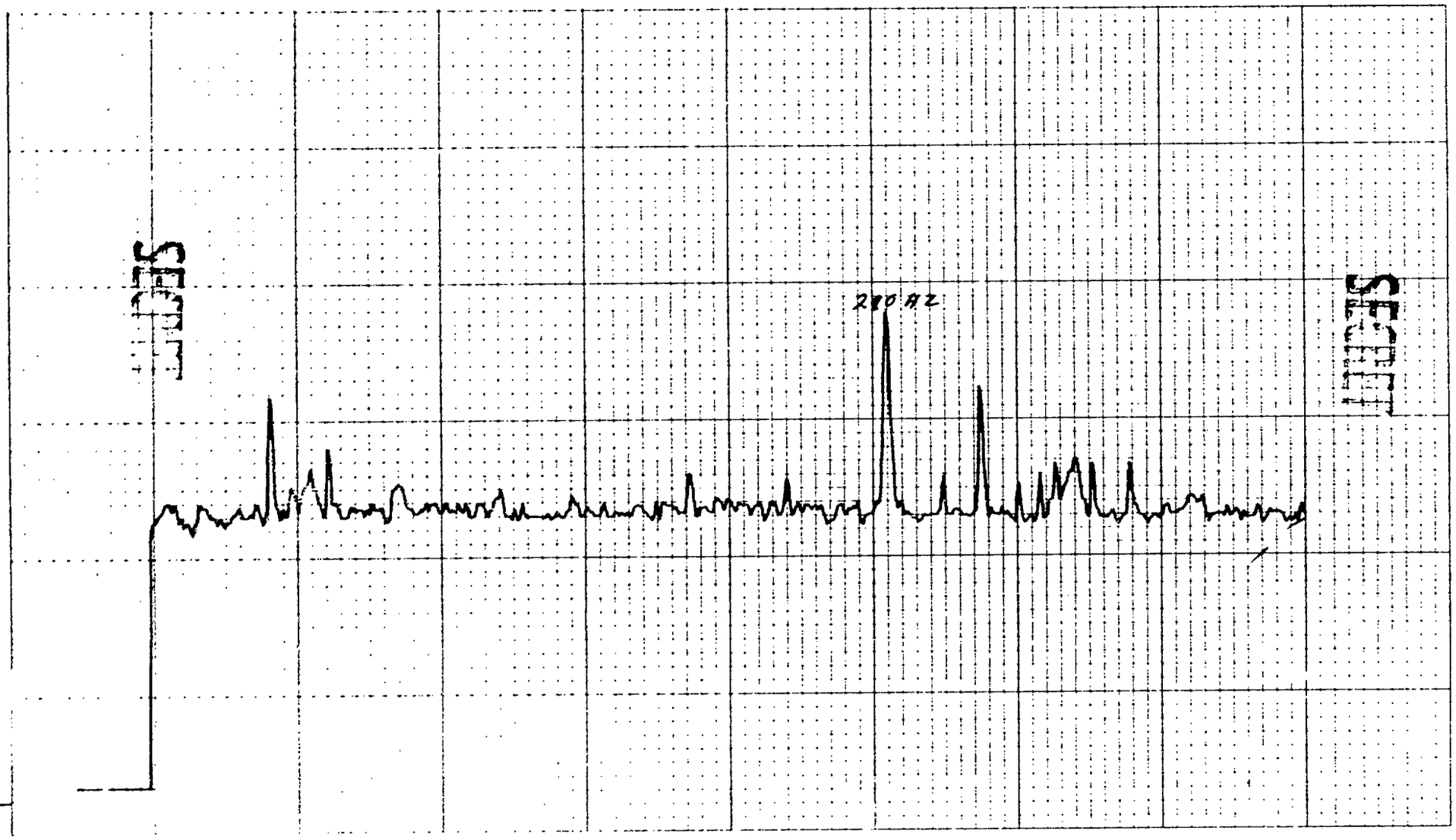
CONTROL: 3-15 -1501 (7)
OMNI SPECTRUM(ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

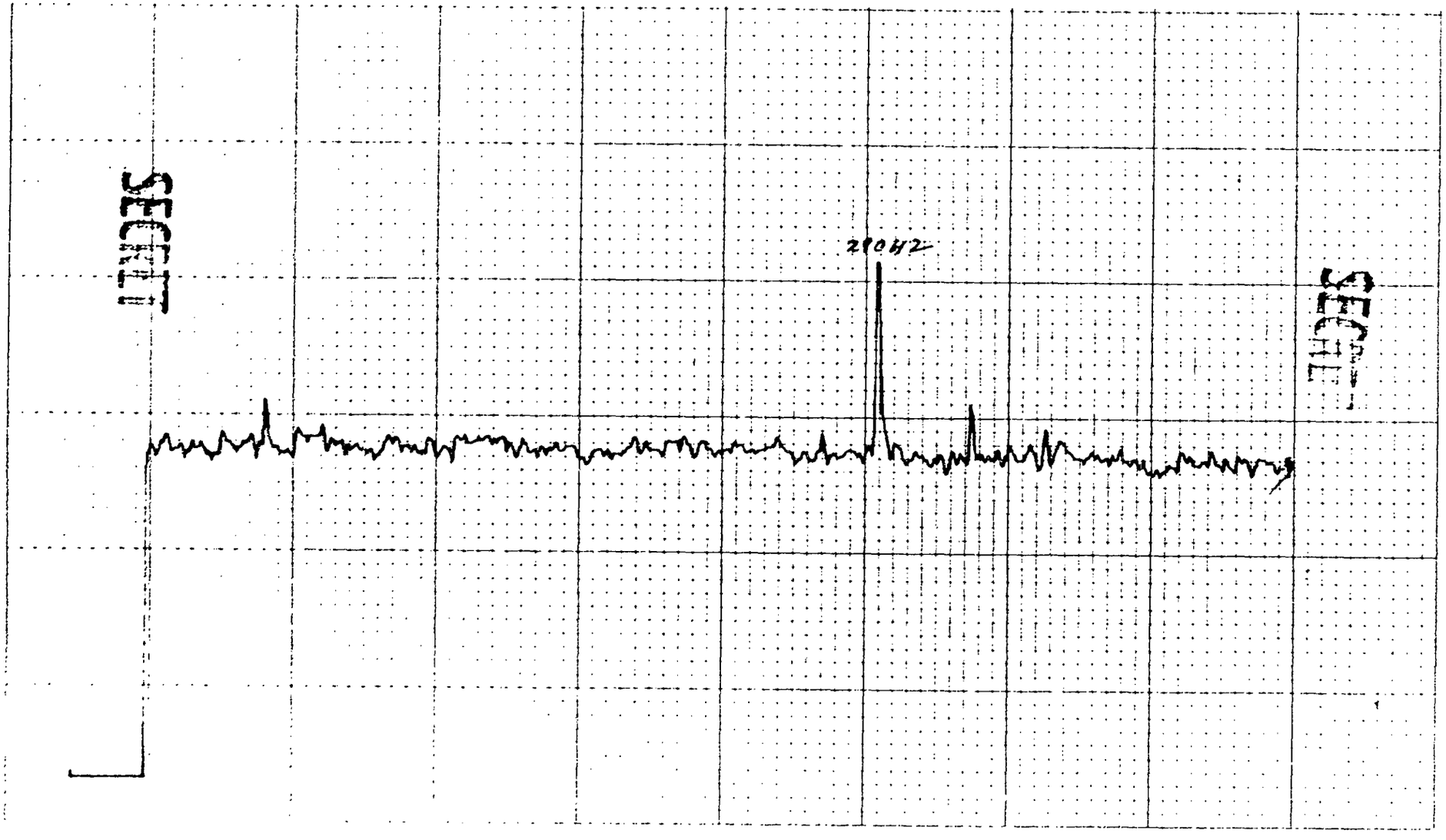
CONTROL: 345-1501 (8)
OMNI SPECTRUM(ELEMENT 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 345-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3240

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



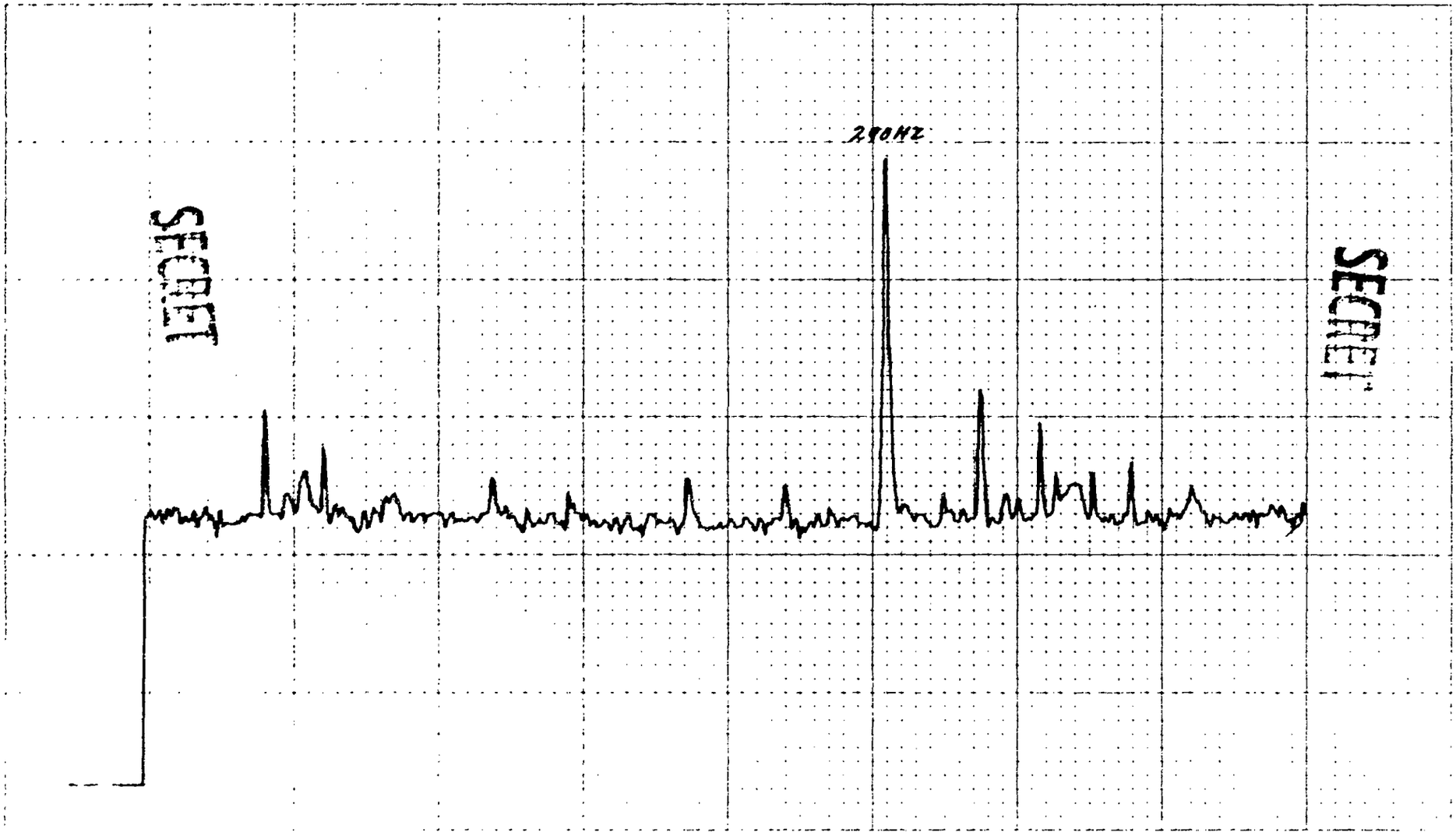
46 0703

CONTROL: 3-15 -1501 (9)
OMNI SPECTRUM(ELEMENT 19)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:
DATE/TIME: 345-77-1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

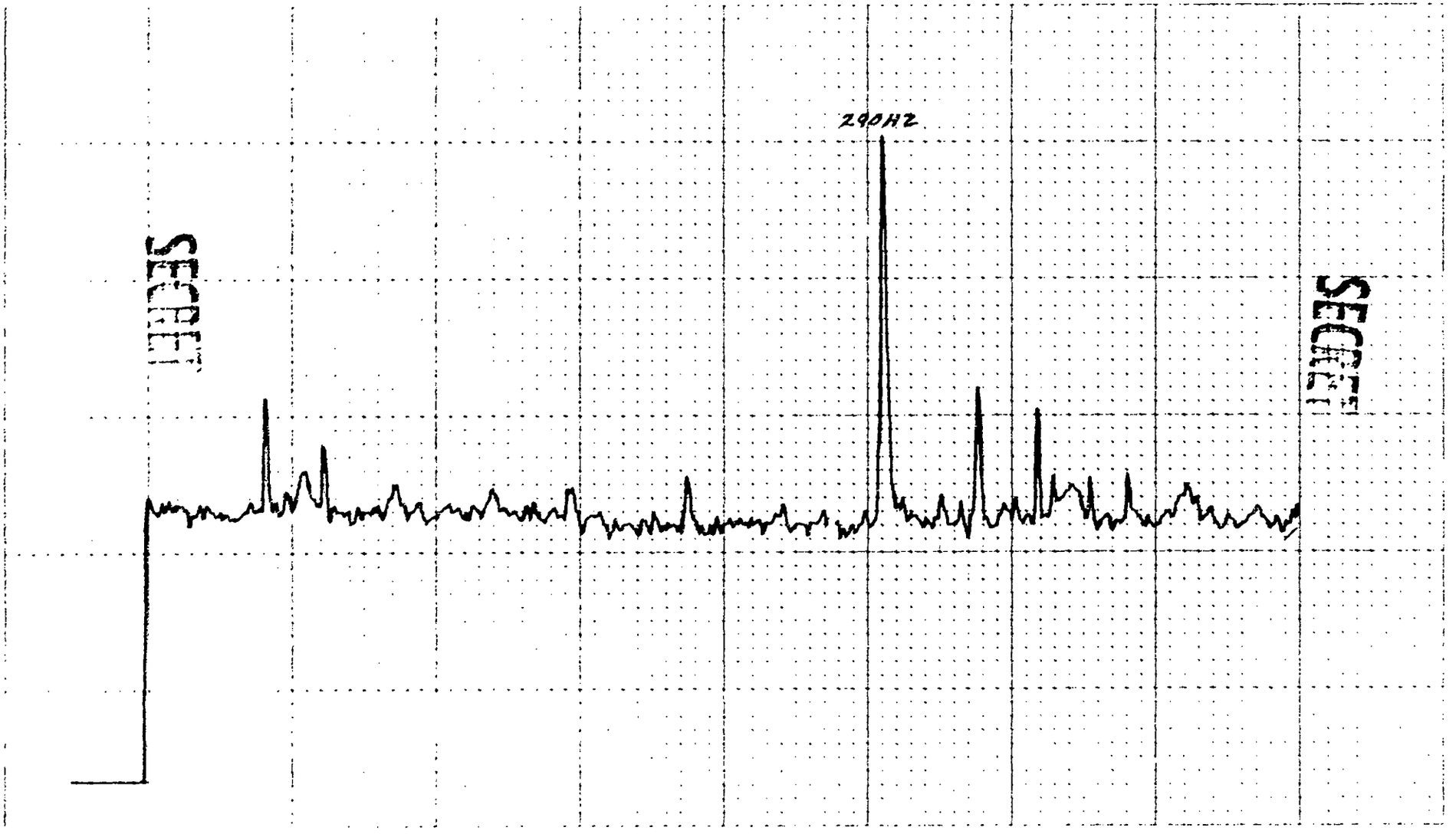
CONTROL: 3-15-1501 (10)
OMNI SPECTRUM (ELEMENT 20)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3740

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

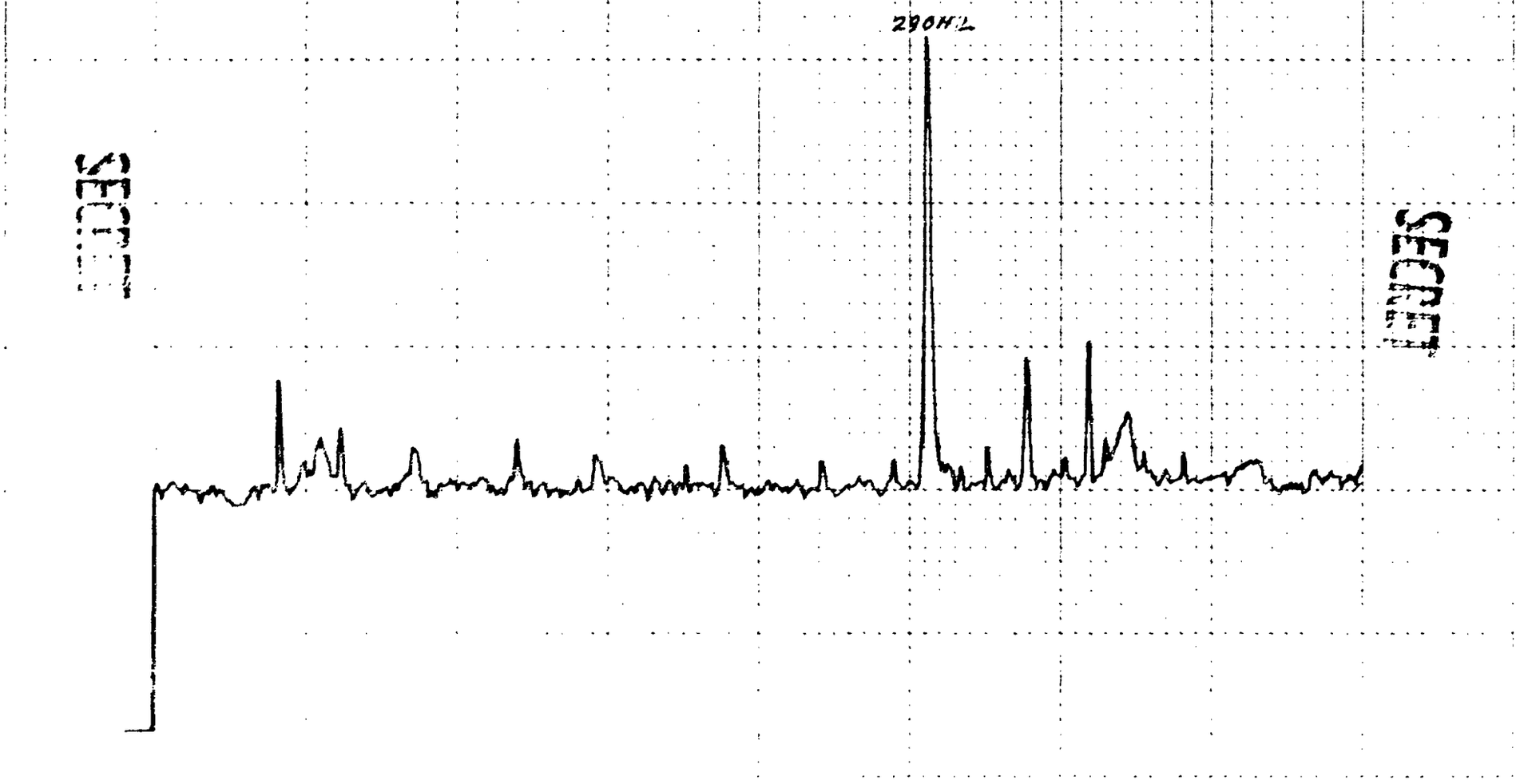
CONTROL: 345 - 1501 (11)
OMNI SPECTRUM(ELEMENT 23)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

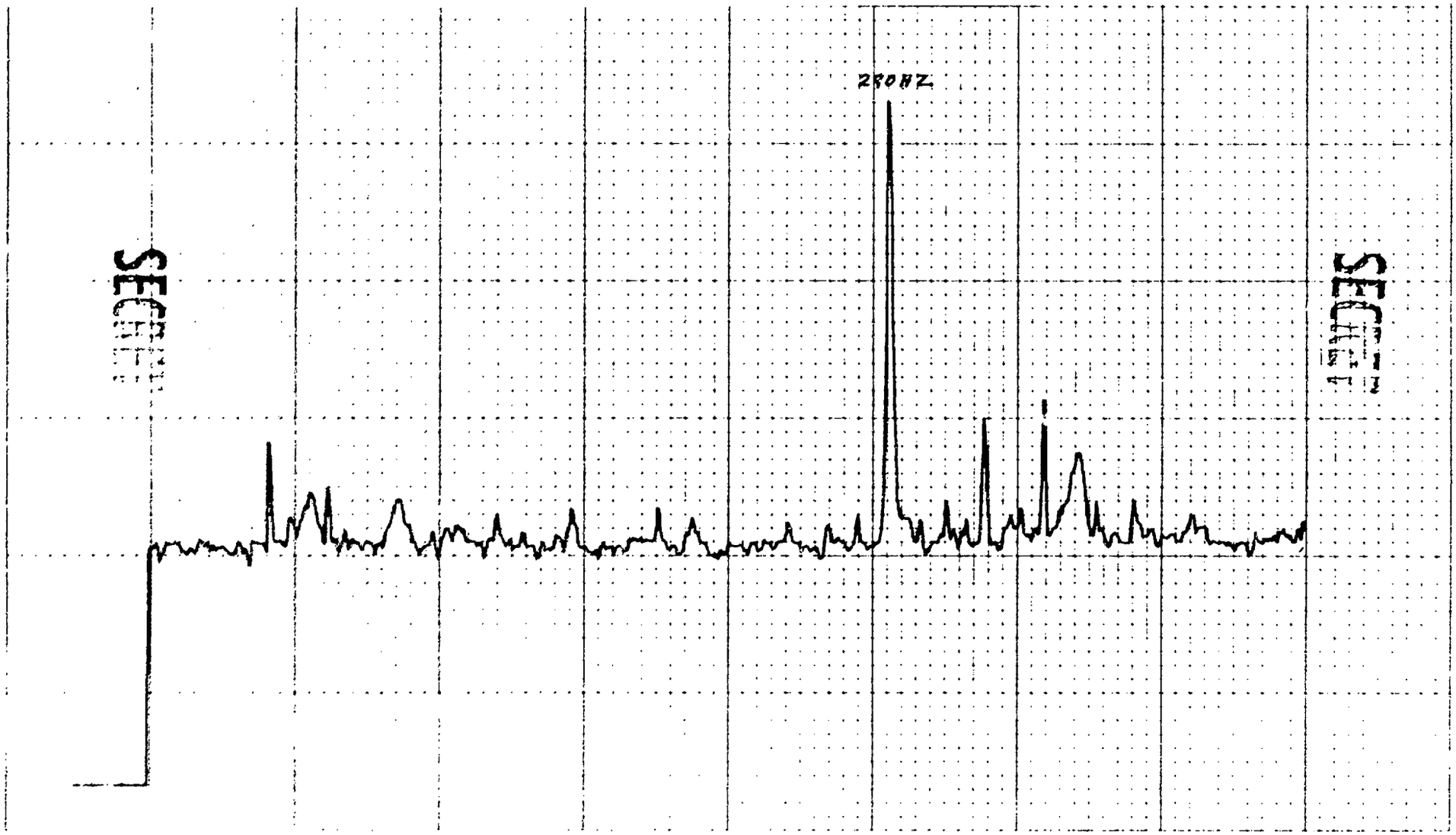
CONTROL: 3-15-1501 (12)
OMNI SPECTRUM(ELEMENT 24)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

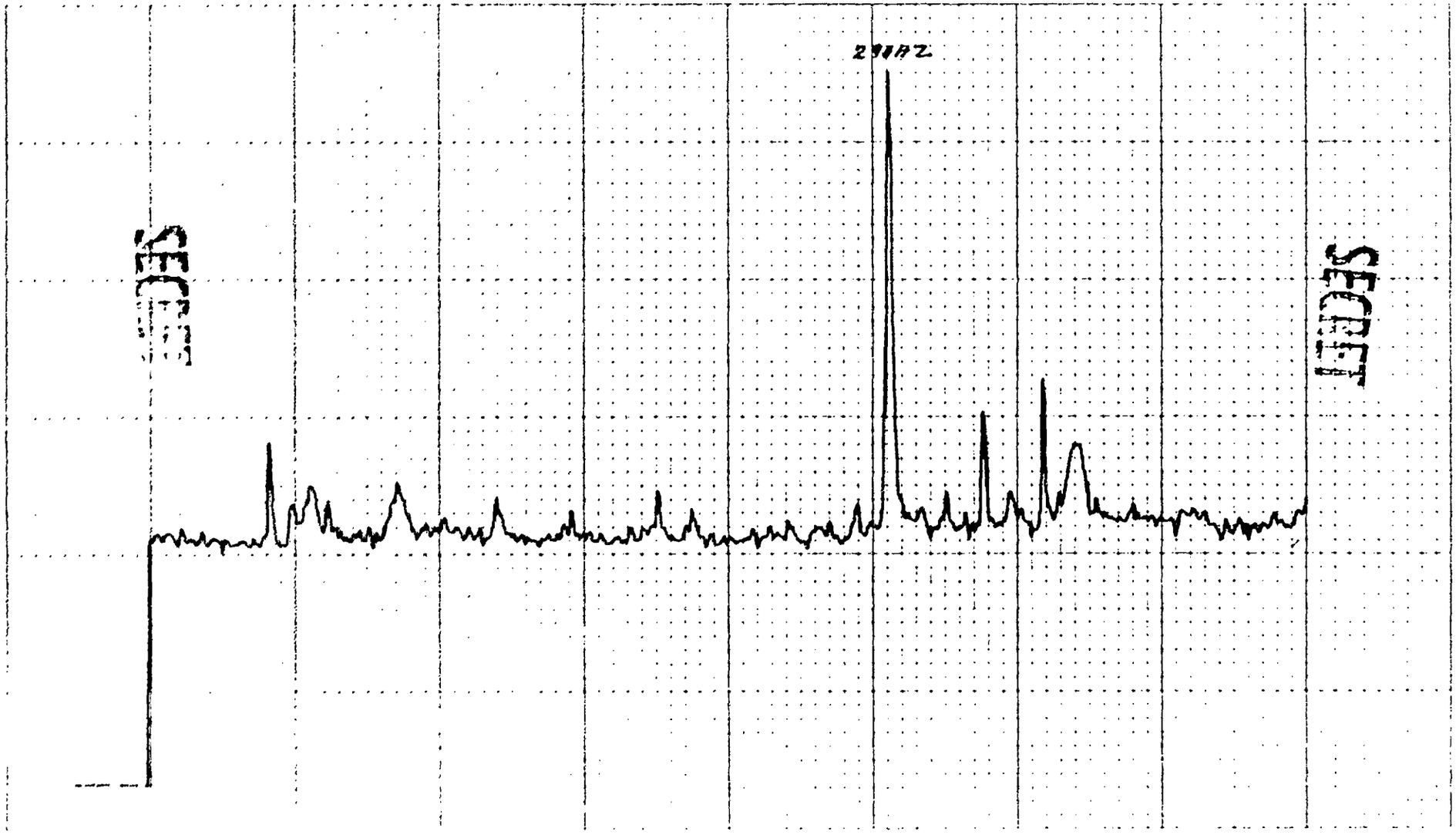
CONTROL: 3-15-1501 (13)
OMNI SPECTRUM(ELEMENT 26)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 7740

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E

46 0703

CONTROL: 3-15-1501 (14)
OMNI SPECTRUM (ELEMENT 29)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

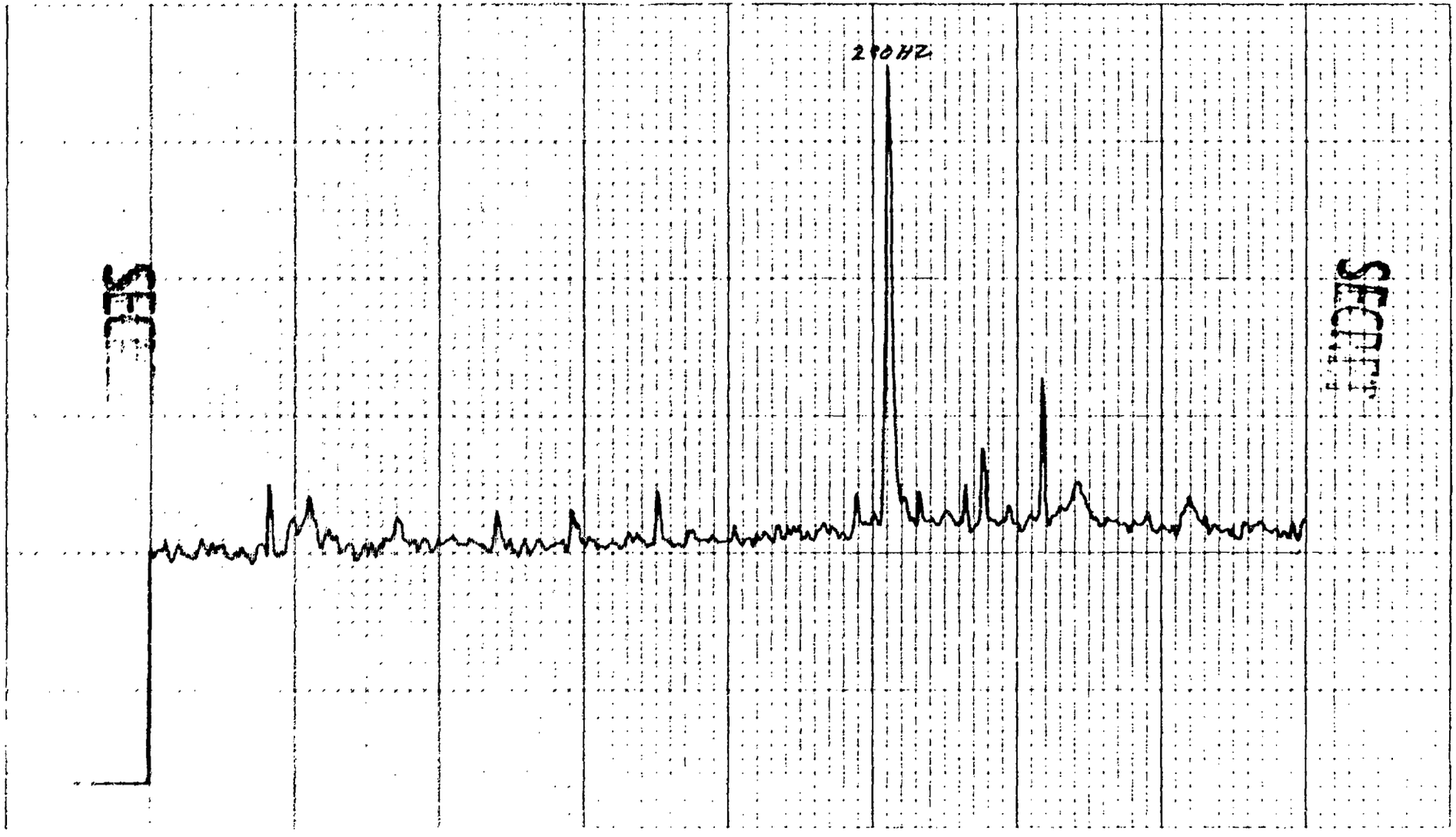
DATE/TIME: 3-15-77 - 1801 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4

INDEX 3740

INTEGRATION TIME 320 SECS

ATTEN: — DB
FILTER WTG: HANNING



46 0703

CONTROL: 345-1501 (15)
OMNI SPECTRUM(ELEMENT 31)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 345-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

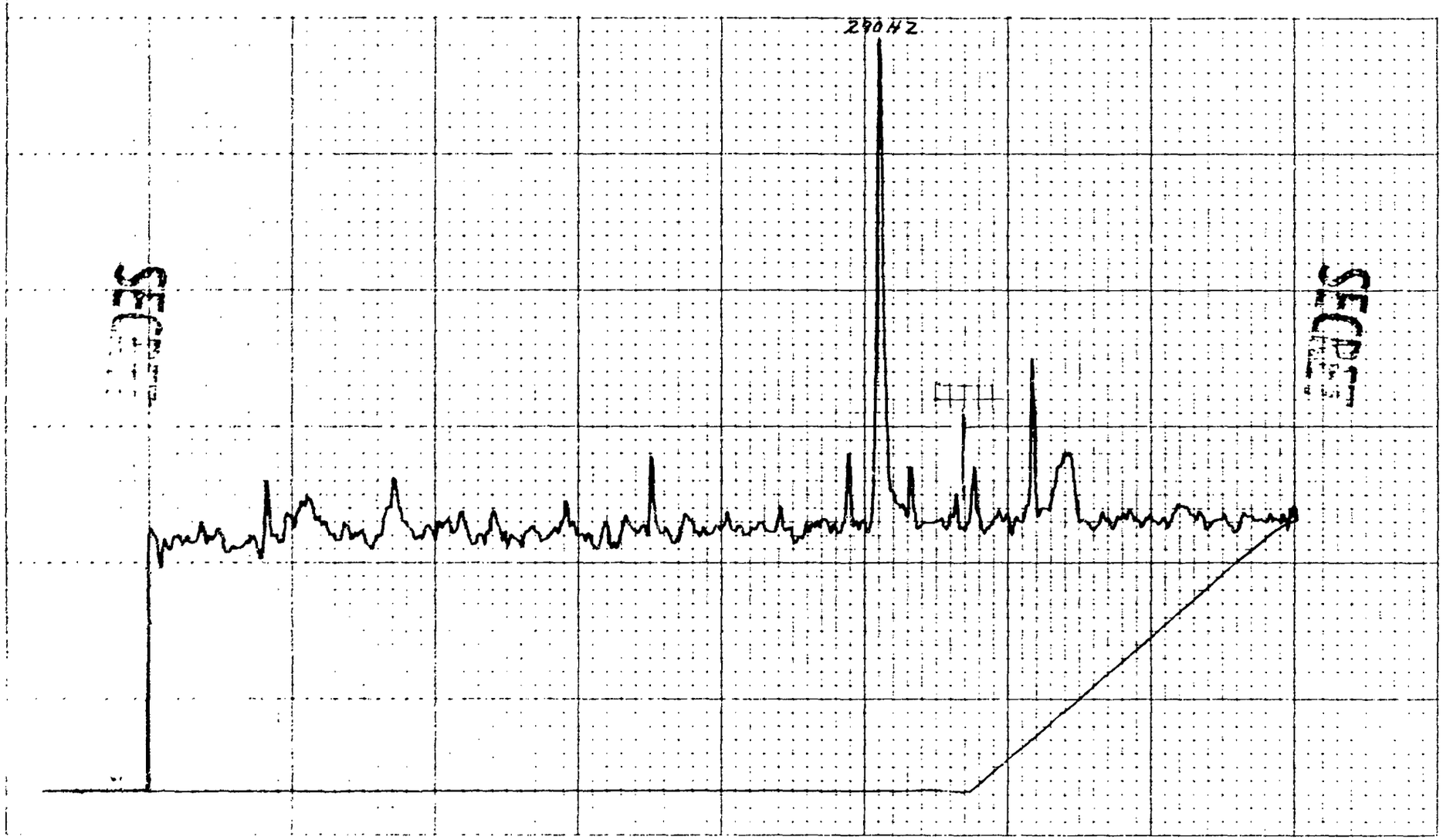
CONTROL: 1501 - 48 (DPB)
OMNI SPECTRUM(ELEMENT 33)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3000

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

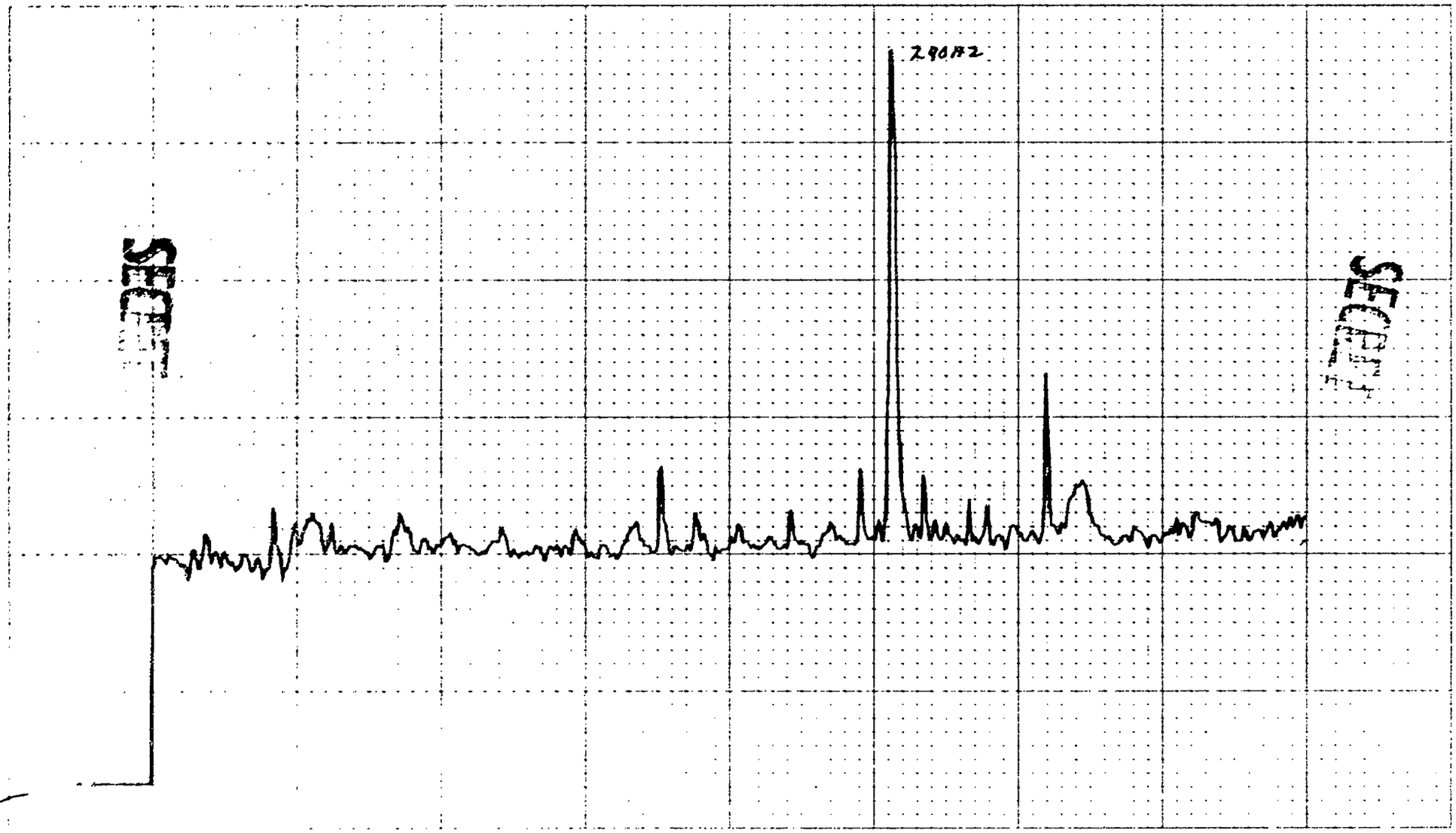
CONTROL: 3-15-1501 (17)
OMNI SPECTRUM(ELEMENT 35)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME:3-15-77 -1501 Z
ANALYSIS BANDWIDTH:1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

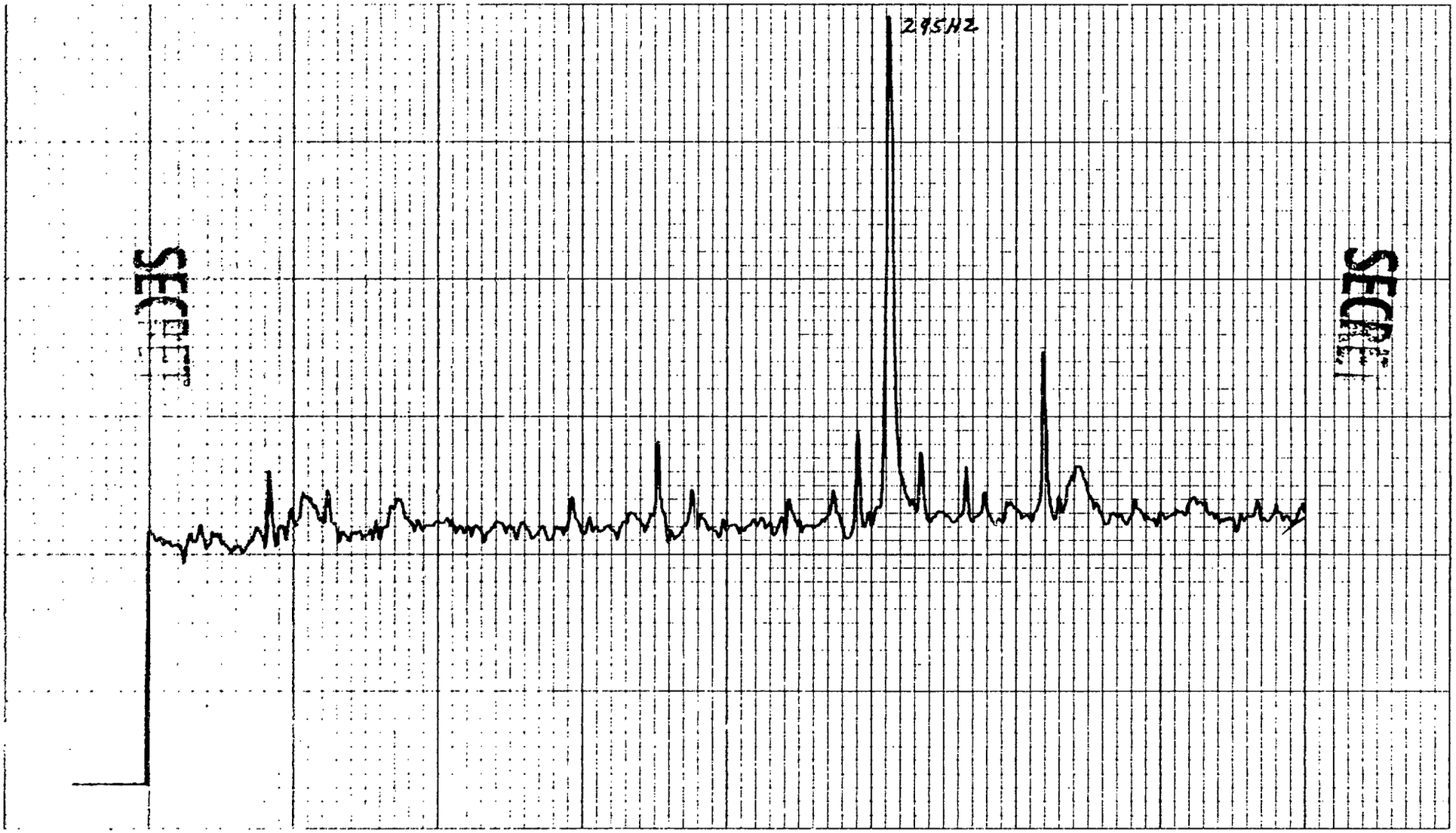
CONTROL: 3-15-1501 (18)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

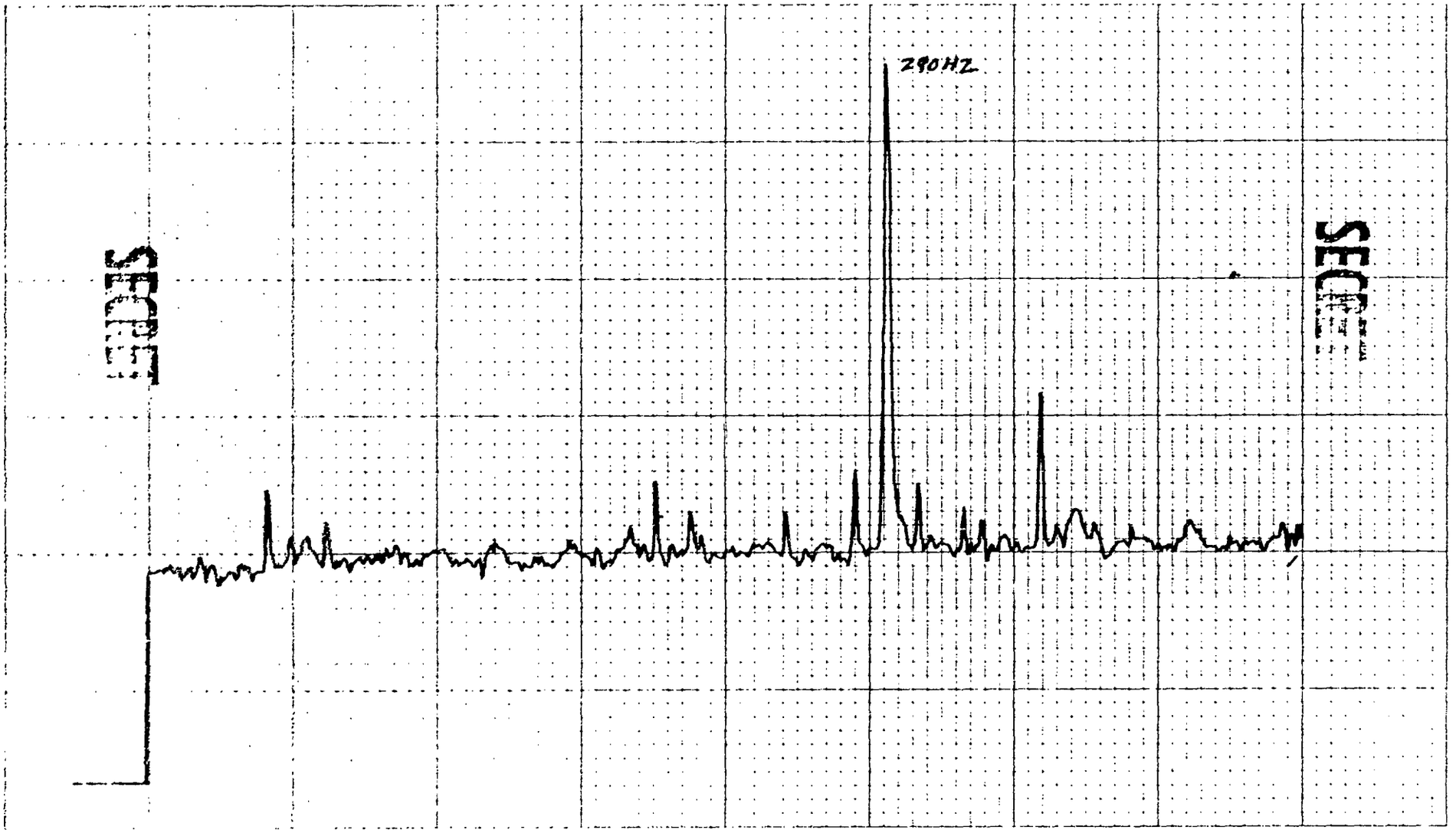
CONTROL: 3-15-1501 (19)
OMNI SPECTRUM(ELEMENT 39)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77-1501 Z
ANALYSIS BANDWIDTH:1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

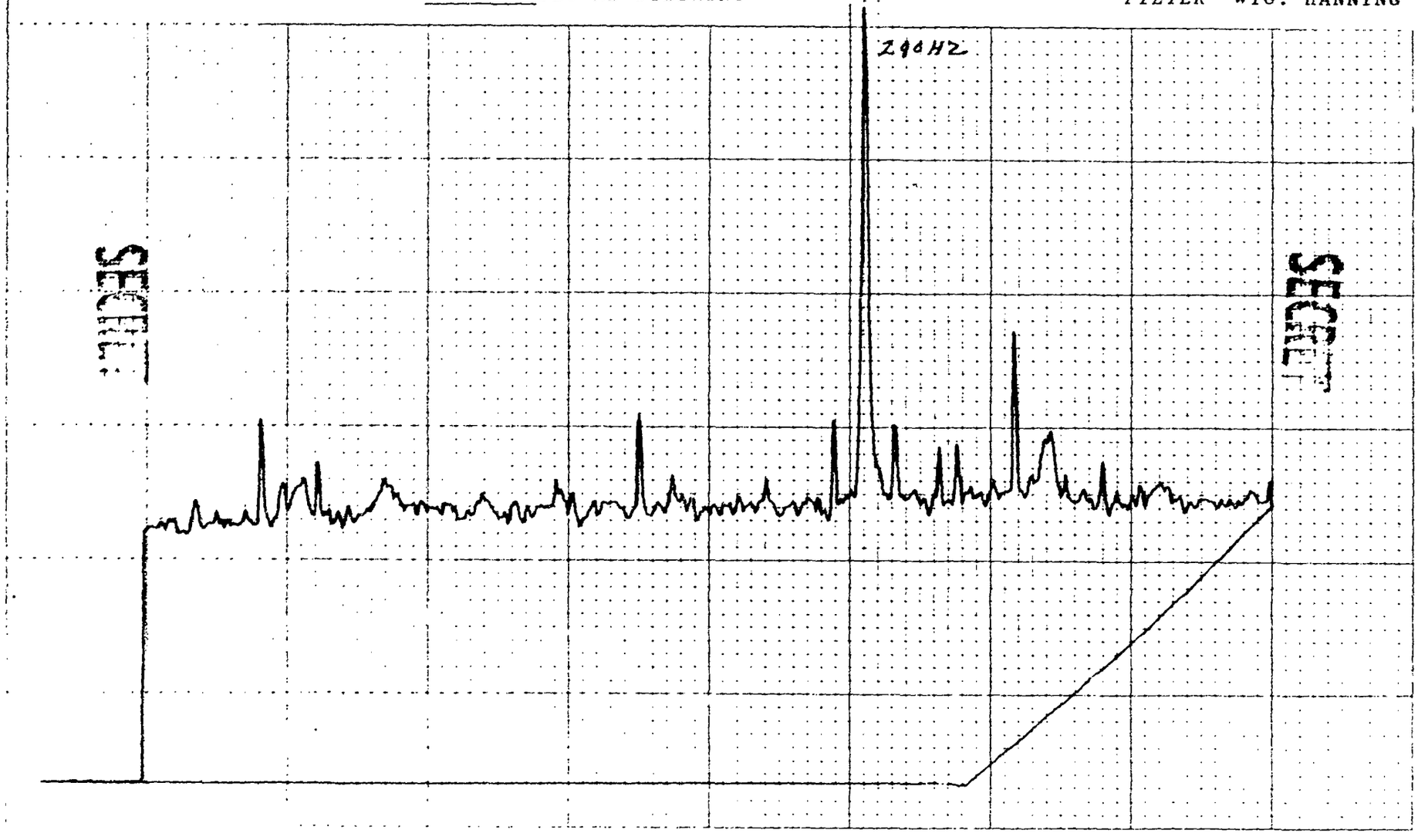
CONTROL: 3-15 -1501 (20)
OMNI SPECTRUM(ELEMENT 41)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
—— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

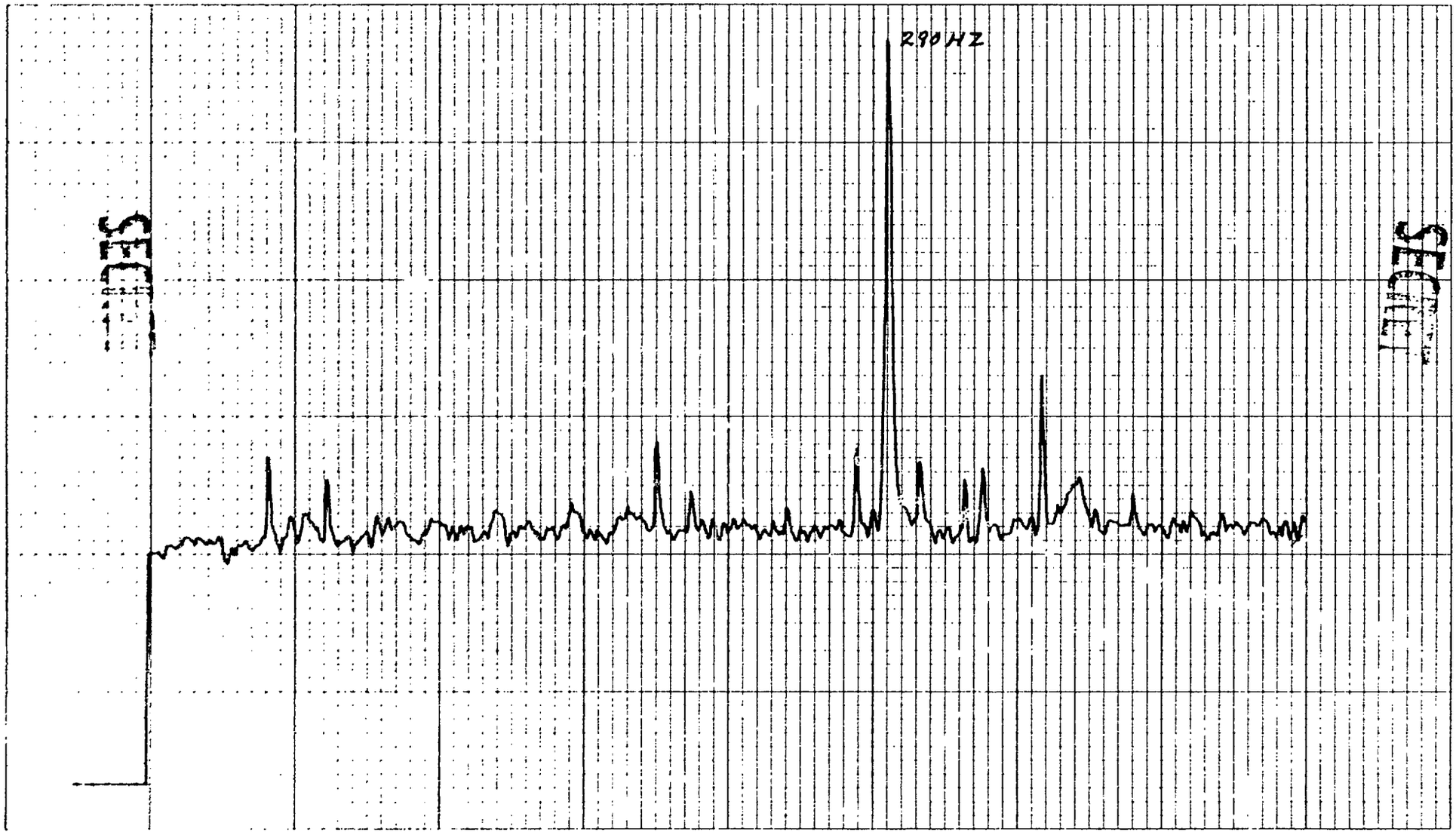
CONTROL: 345 -1501 (21)
OMNI SPECTRUM(ELEMENT 43)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

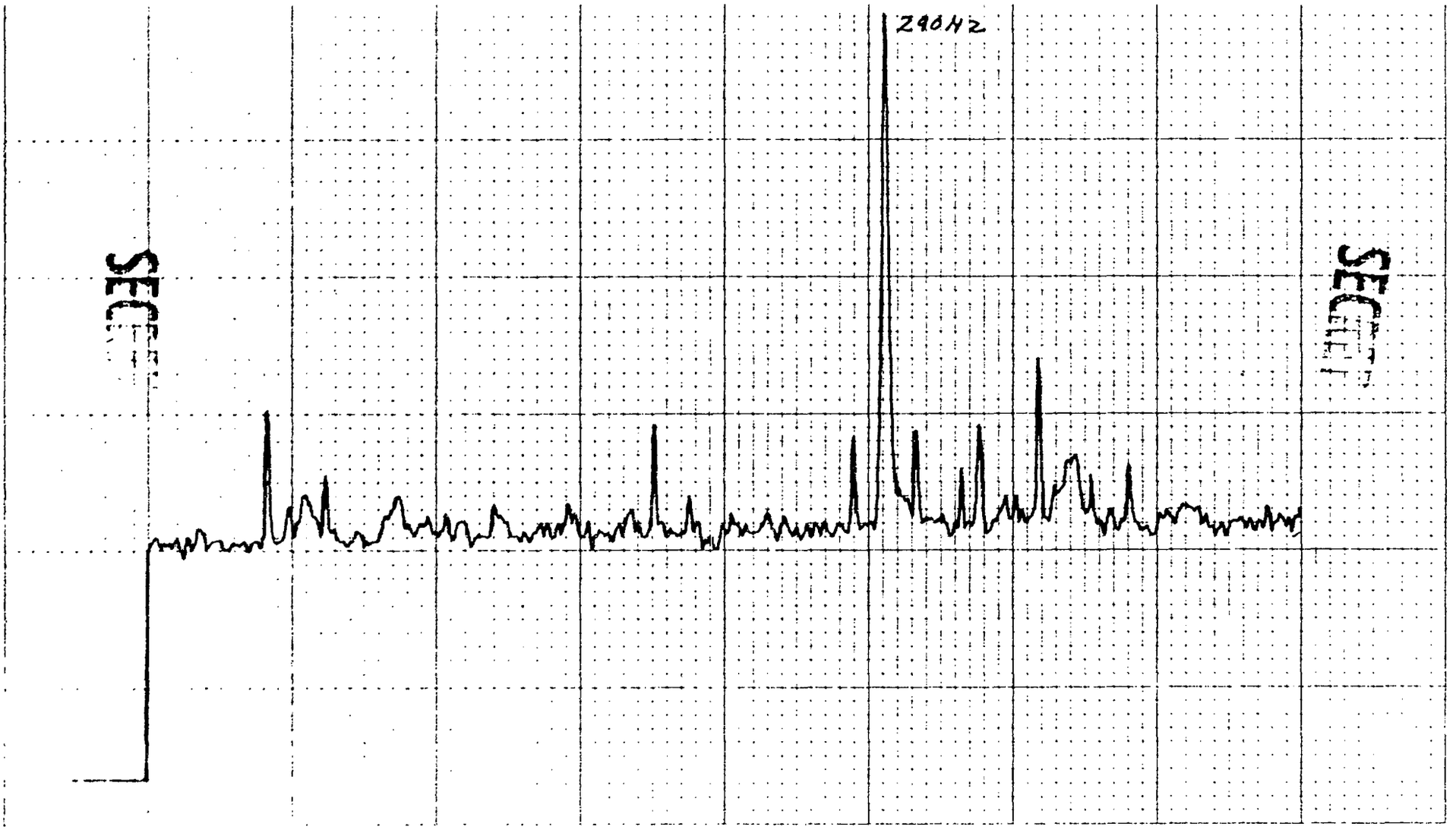
CONTROL: 345 - 1501 (22)
OMNI SPECTRUM (ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 345-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: – DB
FILTER WTG: HANNING



46 0703

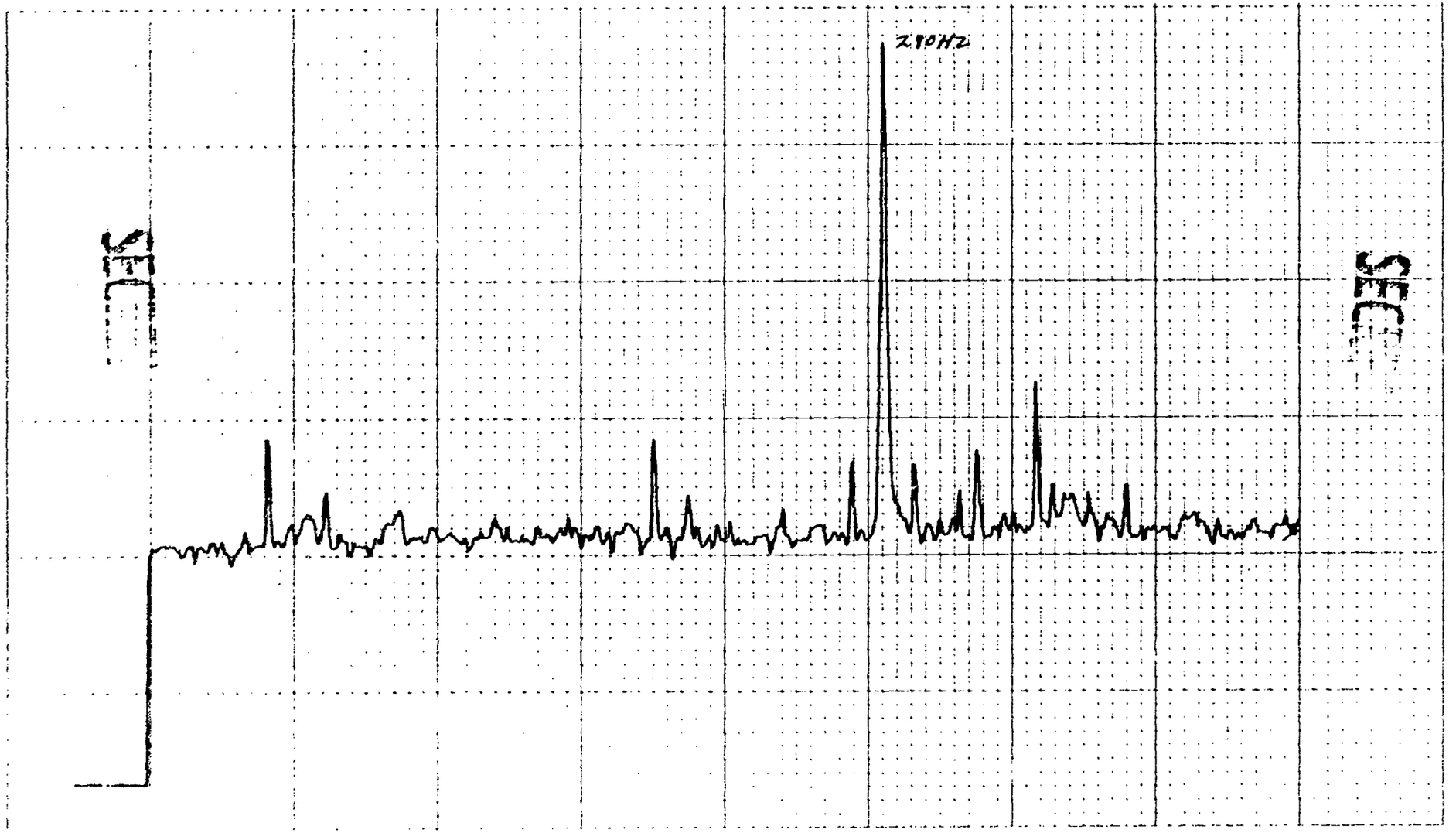
CONTROL: 3-15 -1501 (23)
OMNI SPECTRUM(ELEMENT 47)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

CONTROL: 315 -1501 (24)
OMNI SPECTRUM(ELEMENT 49)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

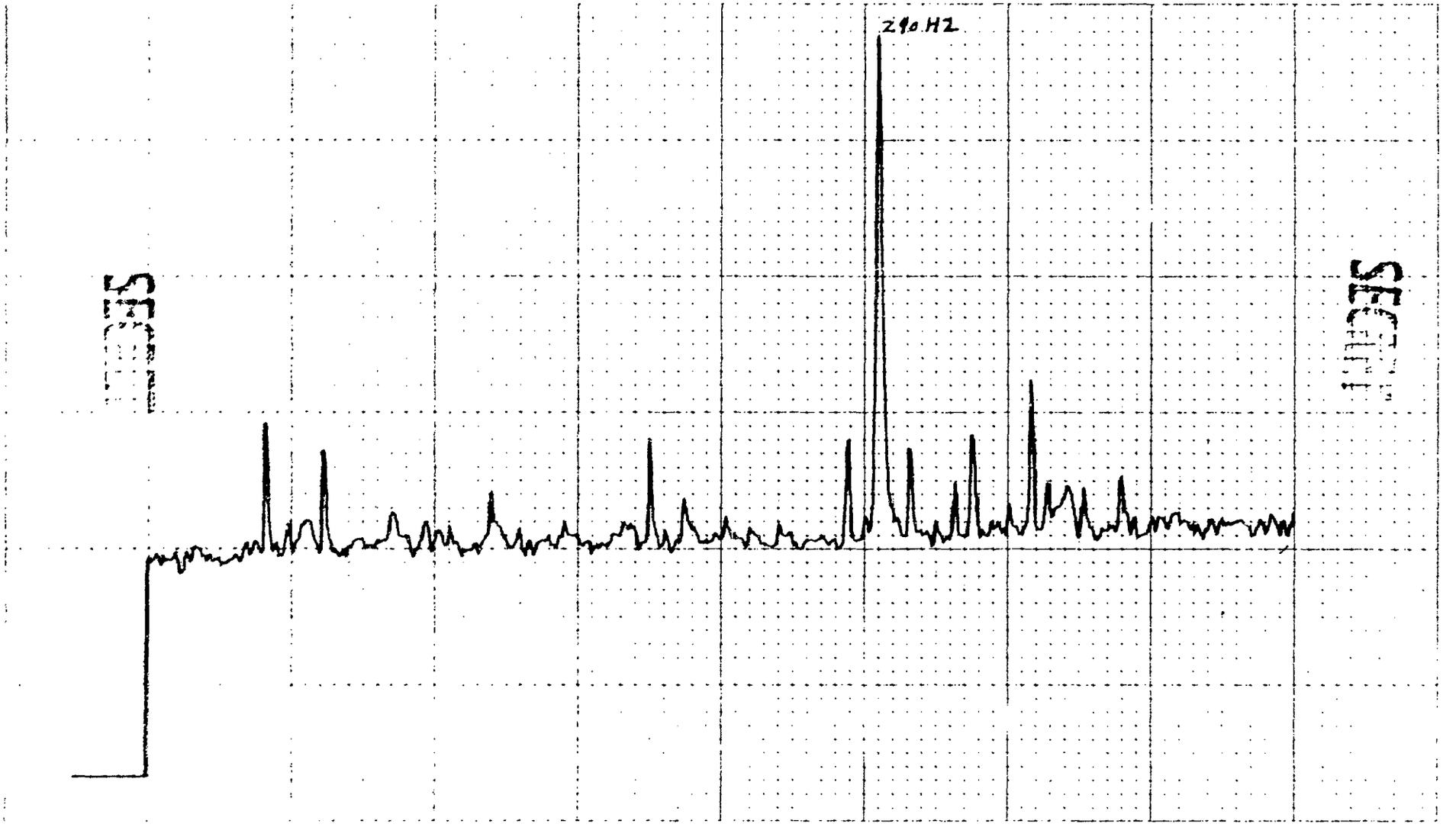
DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

INTEGRATION TIME 320 SECS

REEL: M4 INDEX 3740

ATTEN: — DB
FILTER WTG: HANNING



46 0703

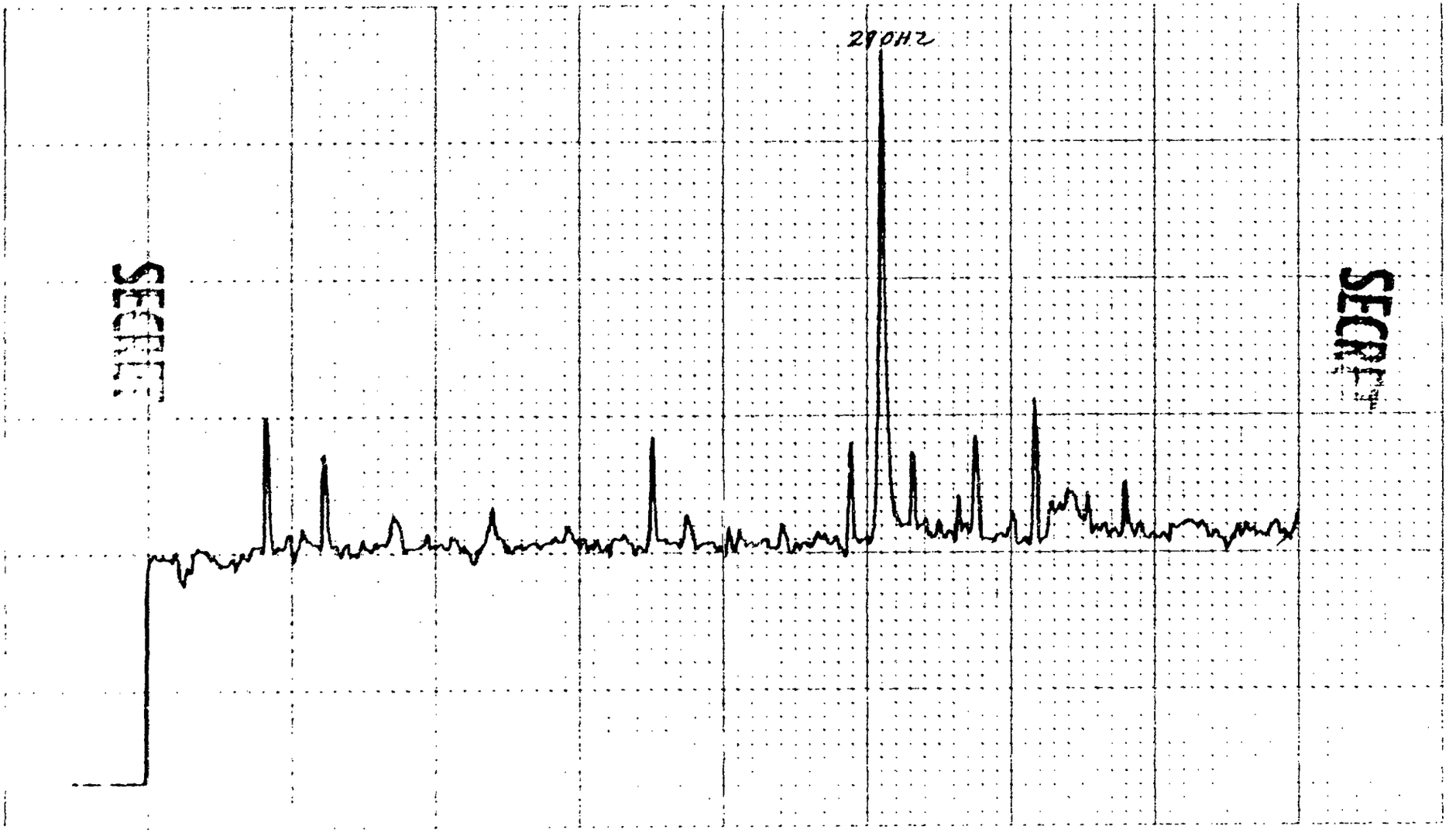
CONTROL: 3-15 -1501 (25)
OMNI SPECTRUM(ELEMENT 51)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3340

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

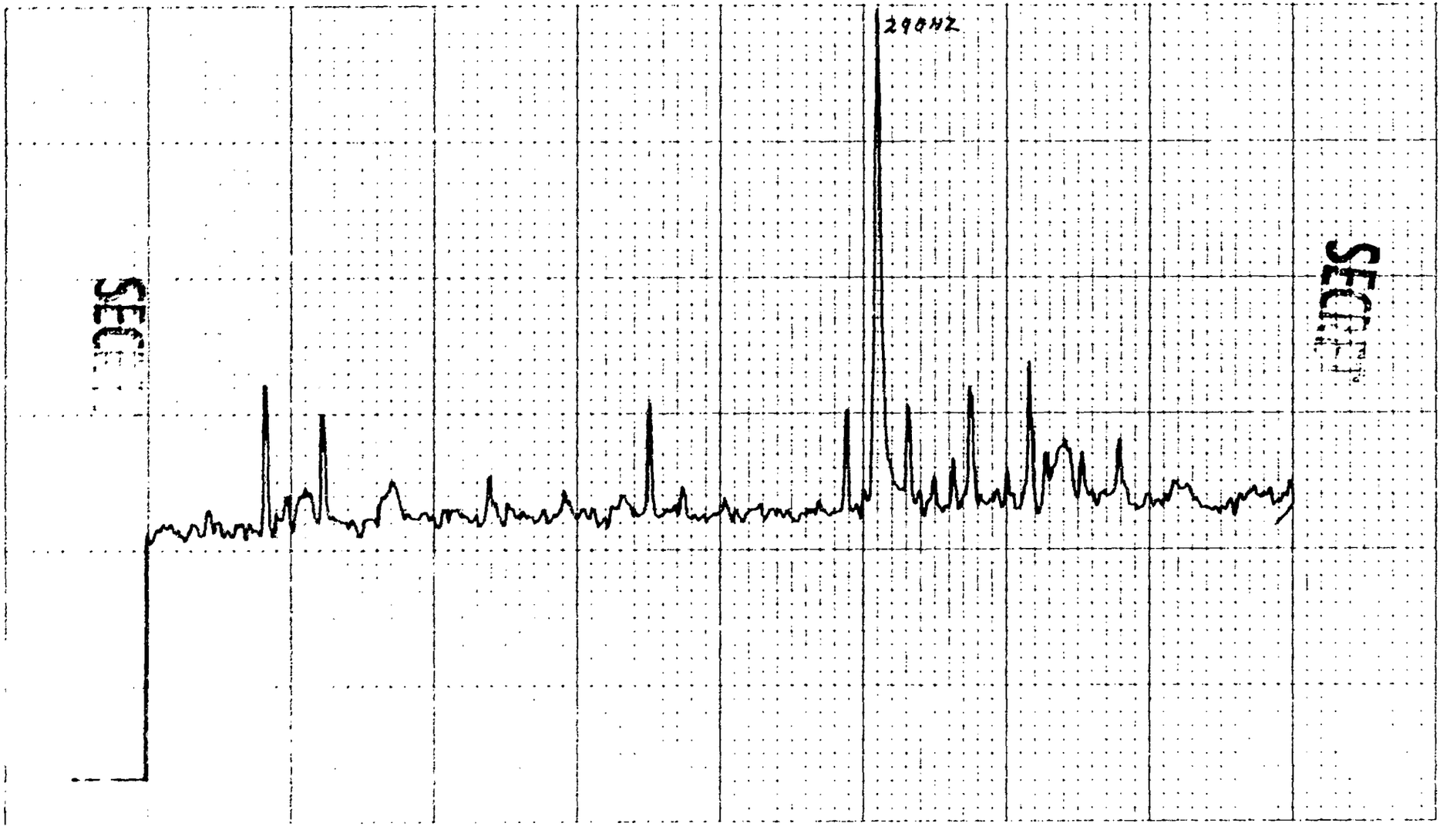
CONTROL: 3-15-1501 (26)
OMNI SPECTRUM(ELEMENT 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

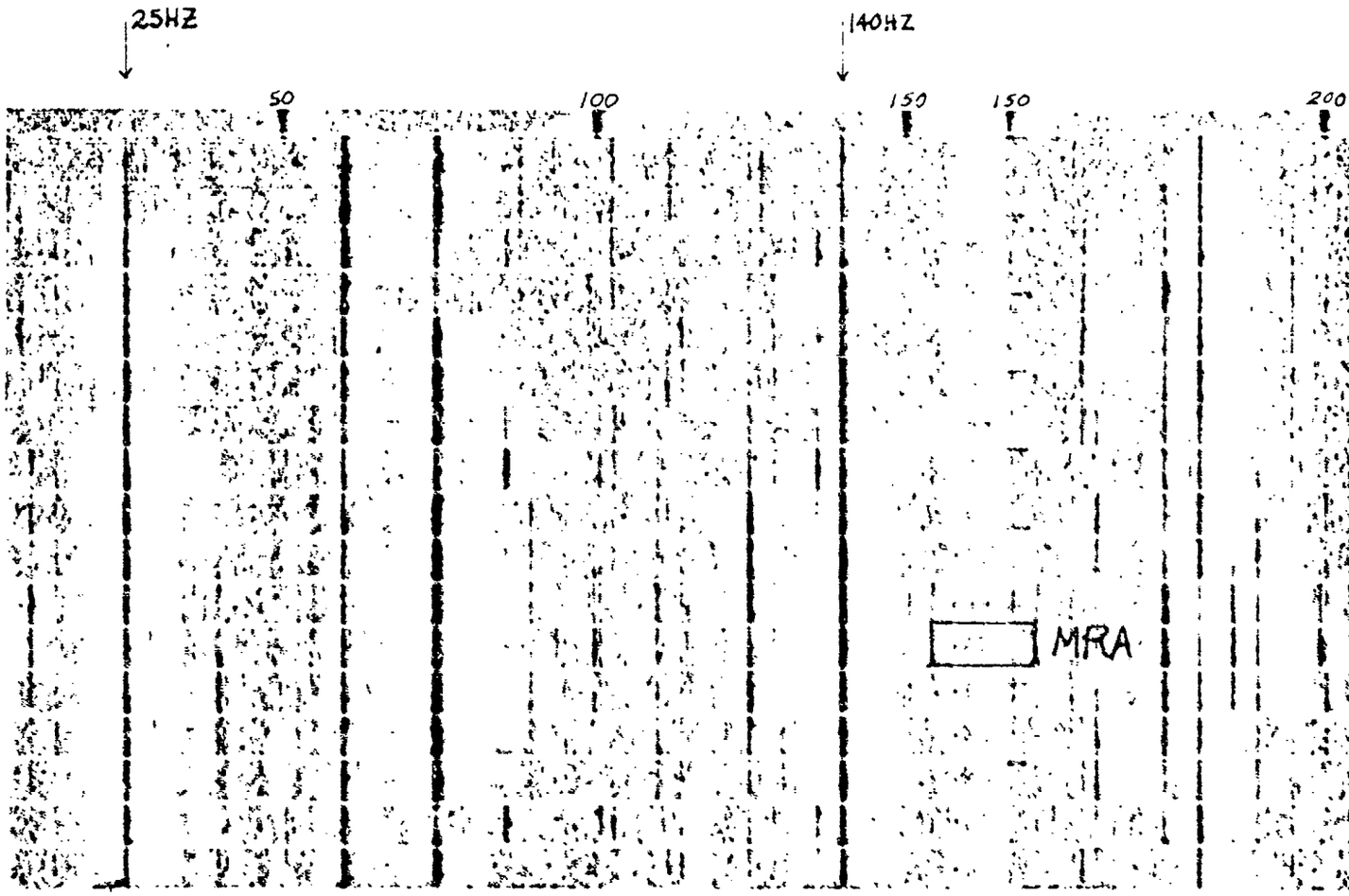
DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M4 INDEX 3740

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING





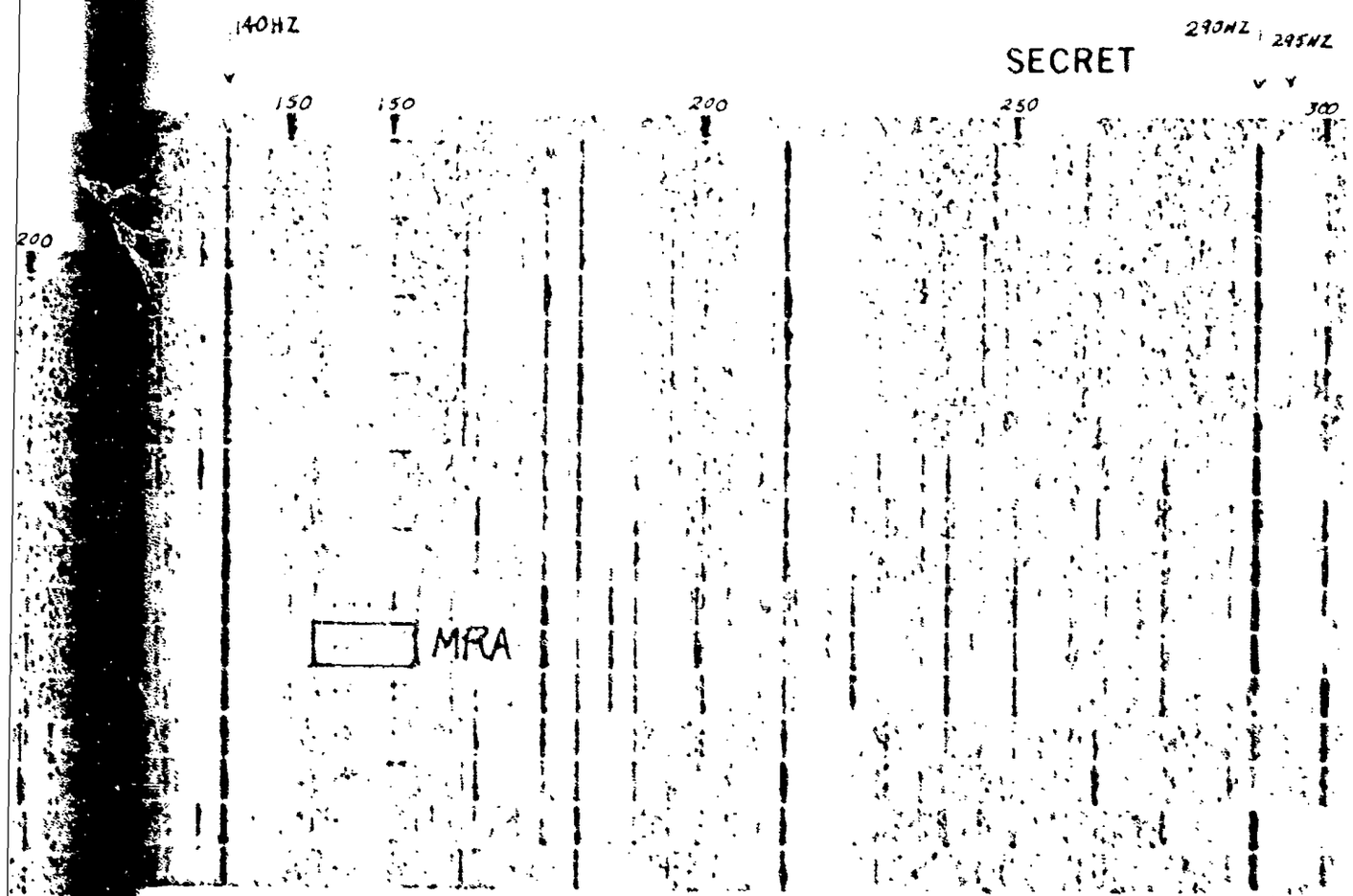
H I S T O G R A M

CONTROL NUMBER [illegible]
NUMBER OF ELEMENTS [illegible]
FREQUENCY BAND [illegible] TO [illegible] HZ
RANGE [illegible] N.M.

TAPE REEL NUMBER [illegible]

ANALYSIS BAND WIDTH [illegible] HZ
WATER DEPTH [illegible] FTS

FILE
DATE
EXER



HISTOGRAM

TAPE REEL NUMBER M-

TAPE COUNT

SECRET

ELEMENT NUMBERS

SAN-XXX-78-0138

ANALYSIS BAND WIDTH Hz

DATE

WATER DEPTH FTS

EXERCISE: BEARING STALE

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 8 FREQUENCY 140 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-22.1	
MCPS-32 CAL. CORRECTION	+10	-12.1	
BEAMFORMER GAIN	+18	+ 5.9	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .2	+6.1	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-61.6	
MCPS-32 CAL. CORRECTION	+10	-51.6	
BEAMFORMER GAIN	+18	-33.6	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+5.9	
SIGNAL LEVEL FOR SNR	-33.6	39.5	
PROCESSOR CORRECTION	-4.0	35.5	
MRA CORRECTION	+ .2	35.7	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	27.5	SNR 1 HZ BAND

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 8 FREQUENCY 290 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-21.8	
MCPS-32 CAL. CORRECTION	+10	-11.8	
BEAMFORMER GAIN	+18	+6.2	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	+7.0	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-73.6	
MCPS-32 CAL. CORRECTION	+10	-63.6	
BEAMFORMER GAIN	+18	-45.6	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+6.2	
SIGNAL LEVEL FOR SNR	-45.6	51.8	
PROCESSOR CORRECTION	-4.0	47.8	
MRA CORRECTION	+ .8	48.6	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	40.4	SNR 1 HZ BAND

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 8 FREQUENCY 295 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-58.8	
MCPS-32 CAL. CORRECTION	+10	-48.8	
BEAMFORMER GAIN	+18	-30.8	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	- 30	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-67.7	
MCPS-32 CAL. CORRECTION	+10	-57.7	
BEAMFORMER GAIN	+18	-39.7	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-30.8	
SIGNAL LEVEL FOR SNR	-39.7	8.9	
PROCESSOR CORRECTION	- 4.4	4.5	
MRA CORRECTION	+ .8	5.3	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	-2.9	SNR 1 HZ BAND

CONFIDENTIAL

CONFIDENTIAL

DATA POINT 8

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-19.4	-15.2	
MRA SIGNAL LEVEL	+6.1	+7.0	-30.0
ARRAY SIGNAL GAIN	25.5	22.2	
20 LOG 16 (# of elements)	24	24	
DIFFERENCE	+1.5	-1.8	

ARRAY GAIN

MRA SNR	35.7	40.6	5.3
MEAN OMNI SNR	29.4	35.4	
ARRAY GAIN	6.3	13.2	
THEORETICAL AZMUTH GAIN (at MRA)	10.4	12.1	12.3
DIFFERENCE	-4.1	+1.1	

CONFIDENTIAL

K+E 10 X 10 TO THE INCH

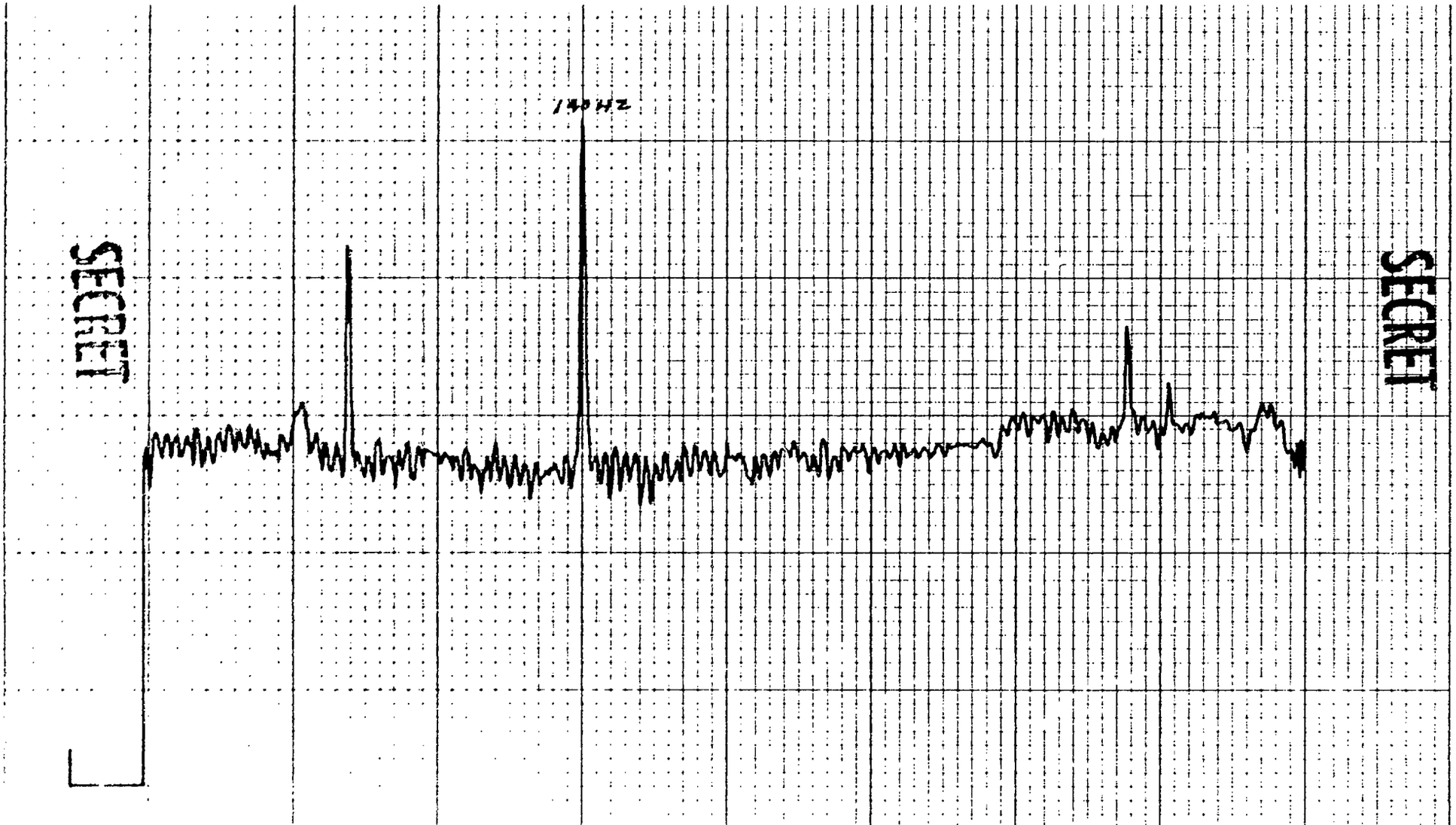
46 0703

CONTROL: 1501 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77-1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+7 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -18 DB



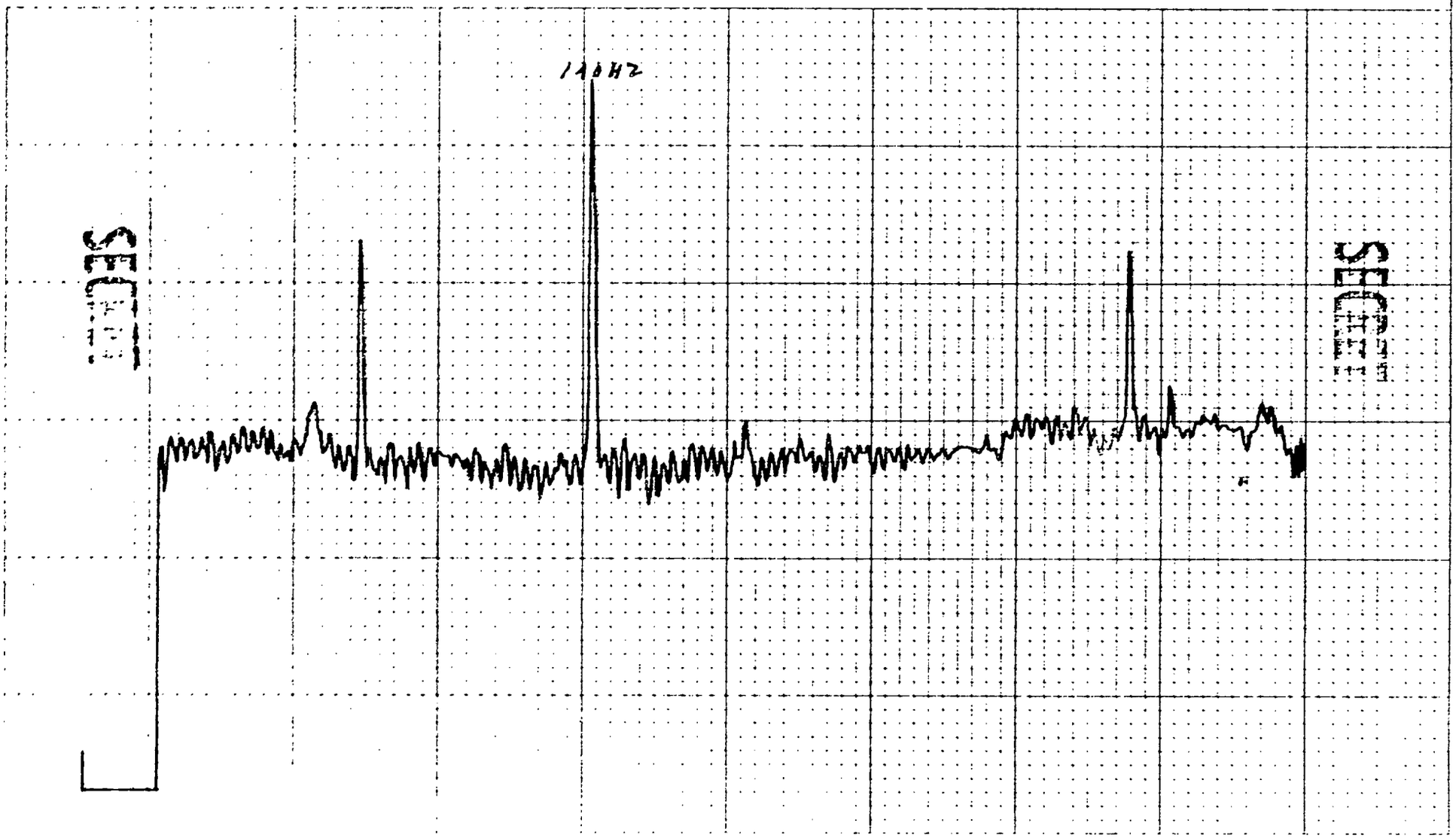
46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10 HZ
+9 DEG. AZ STEERING

REEL: 14
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -18 DB



K+E

46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+11 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -18 DB

K+E

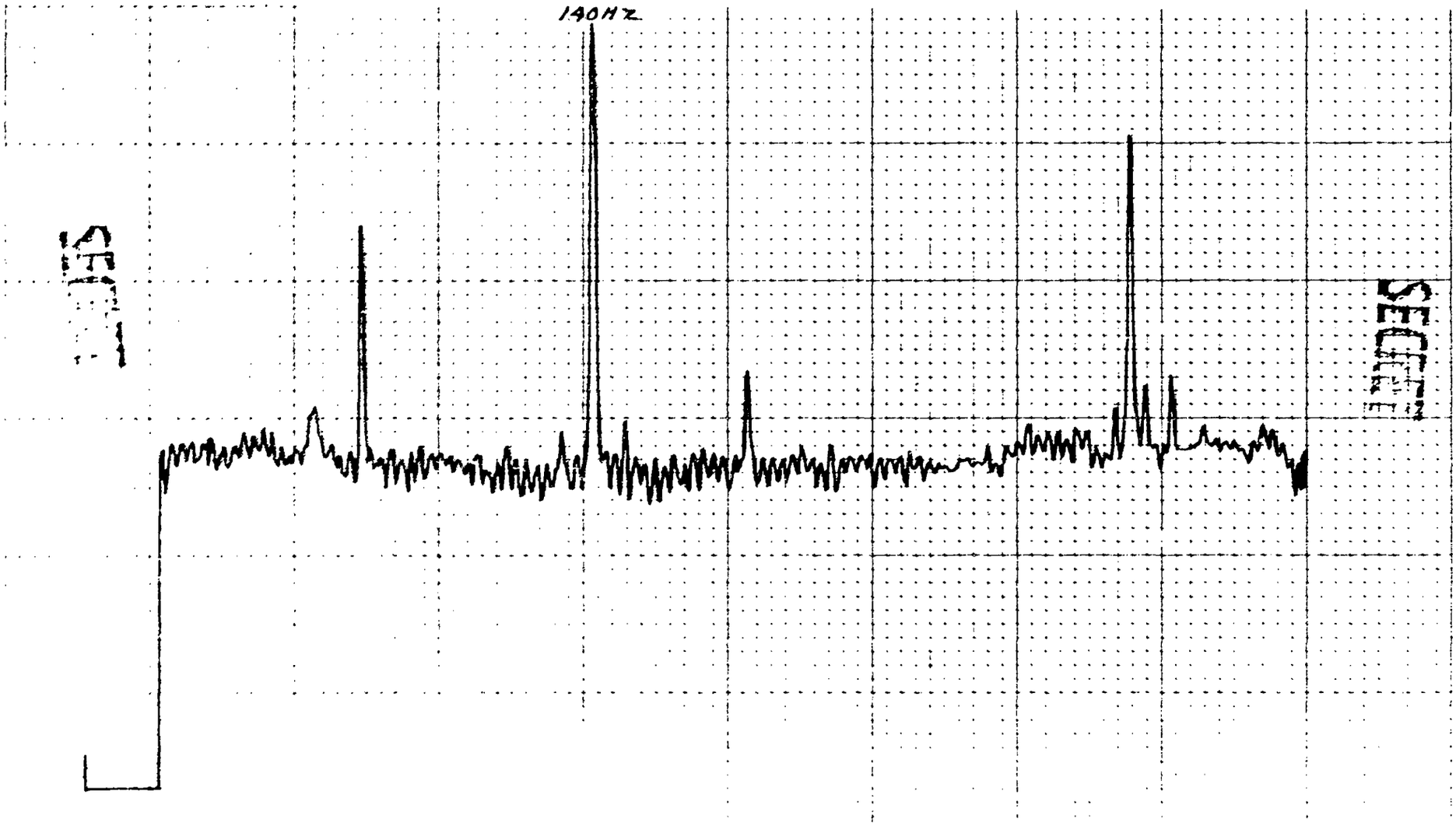
46 0703

CONTROL: 1501 - 48 (DP8)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+13 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: 18 DB

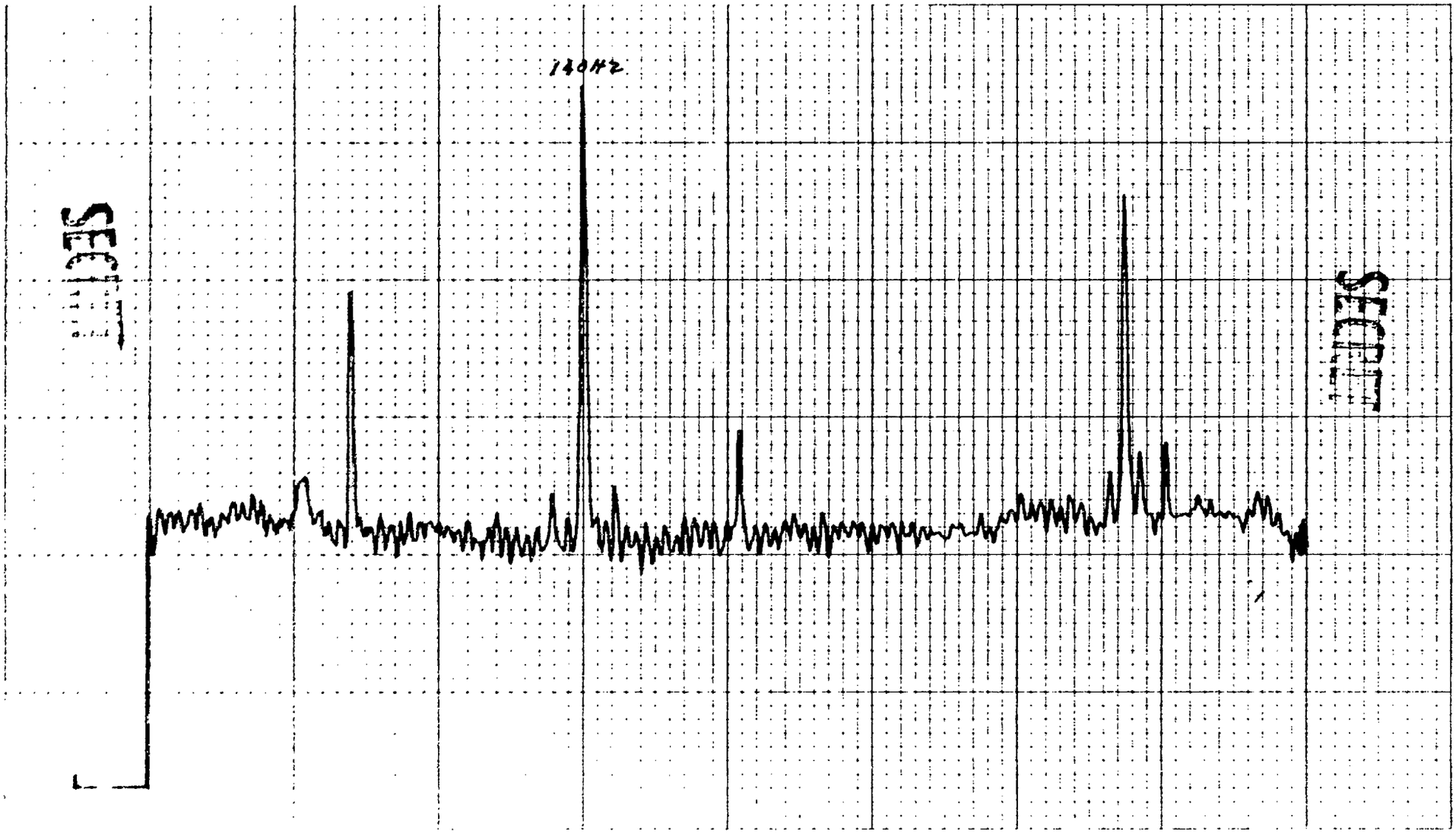


CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+/5 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: 48 DB
WTG: HANNING

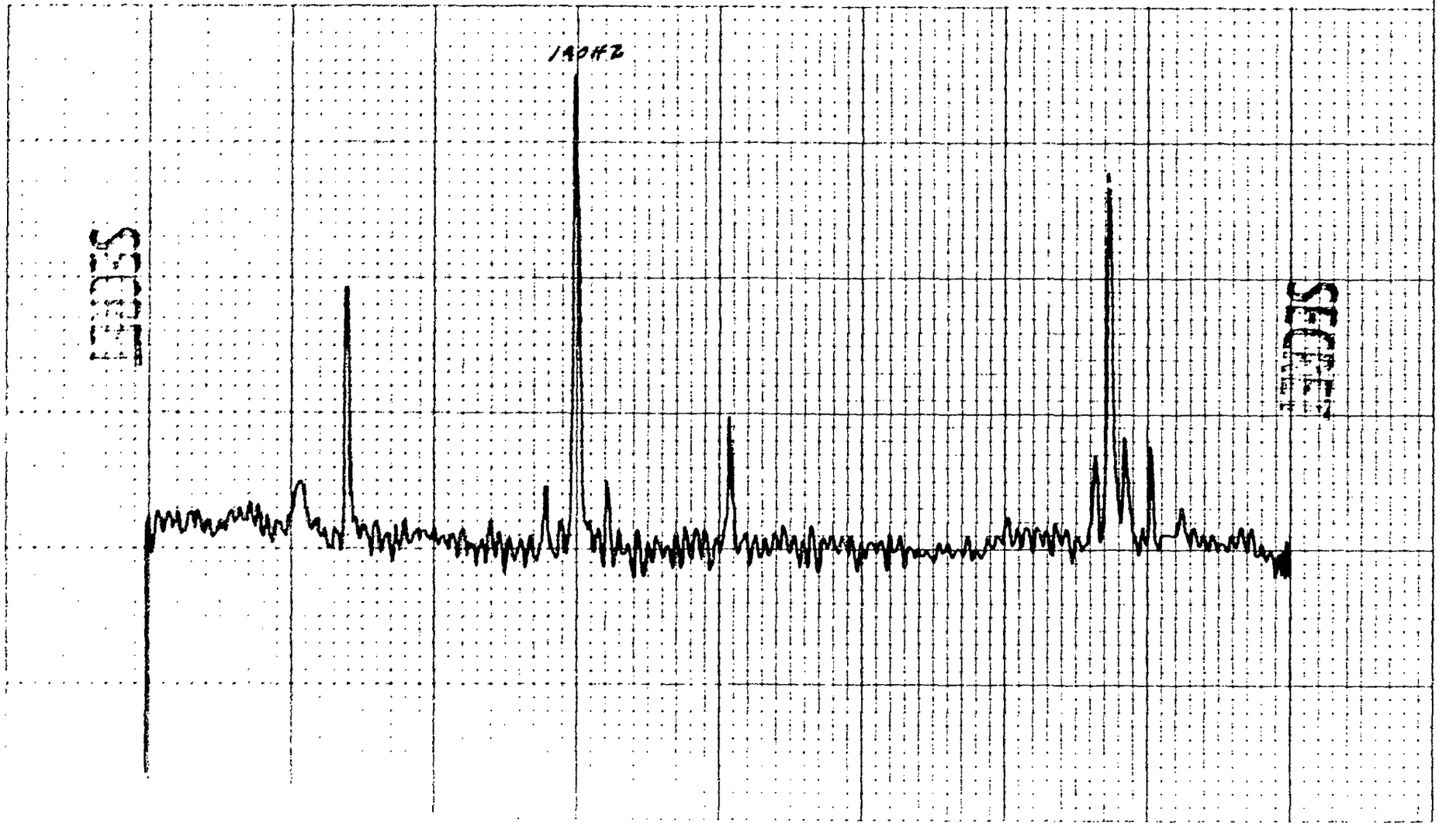


CONTROL: 1501 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+17 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -10 DB
WTG: HANNING



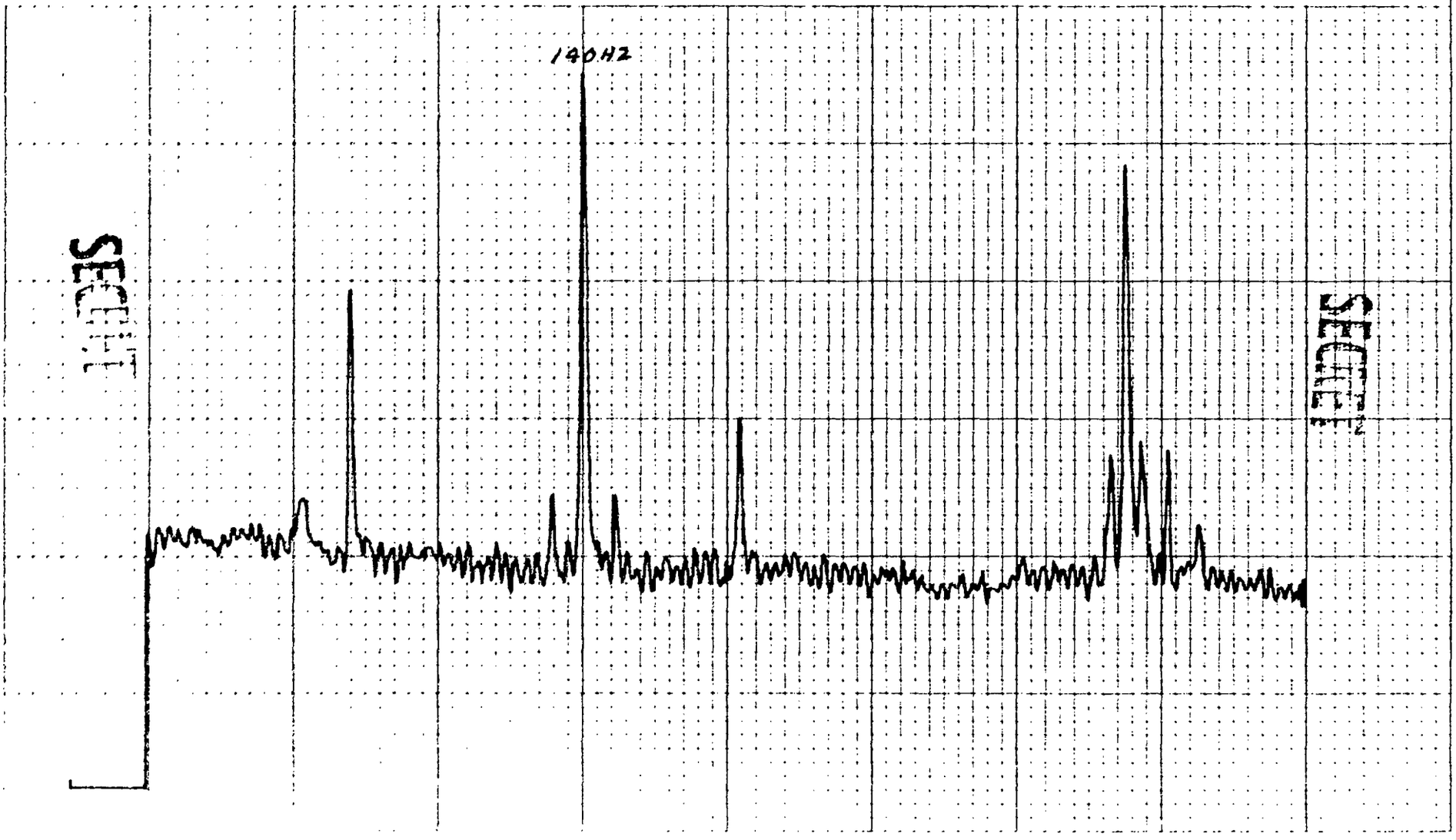
46 0703

CONTROL: 1501 - 16 (D08)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+19 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER

INDEX 300
ATTEN: -18 DB
WTG: HANNING



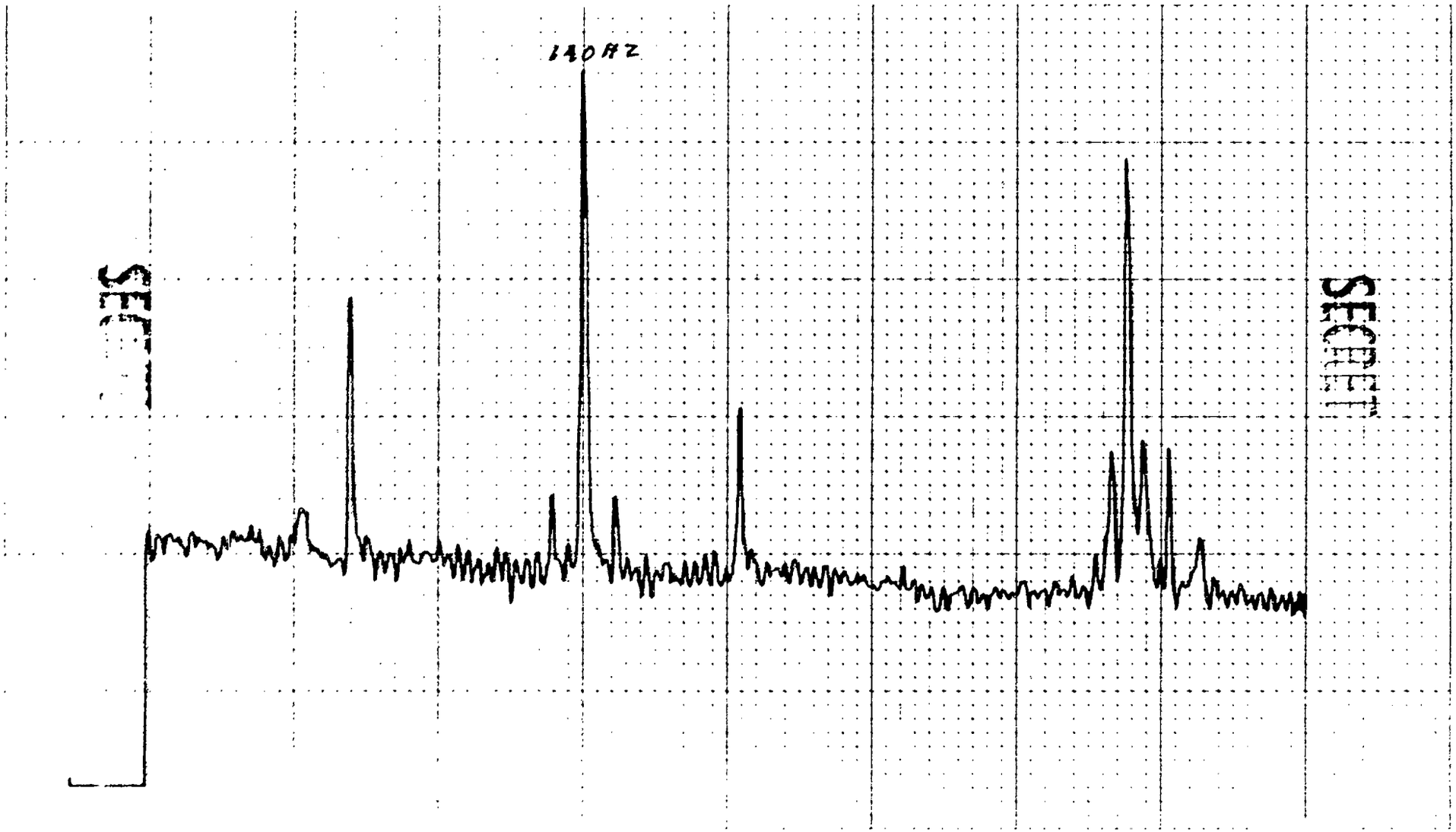
46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+20 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -18 DB



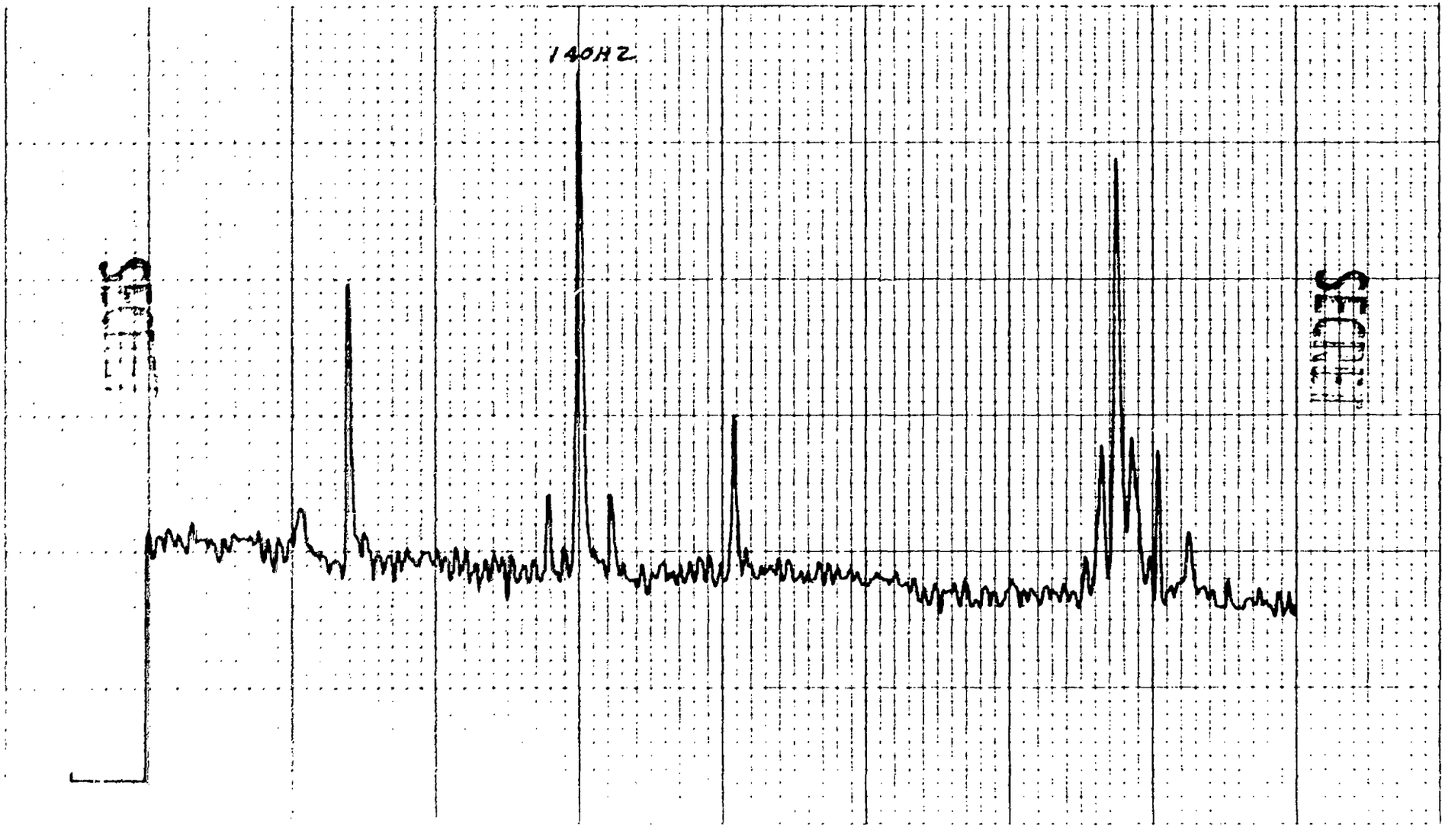
K+E 10 X 10 TO THE INCH 46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+21 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -18 DB
WTG: HANNING



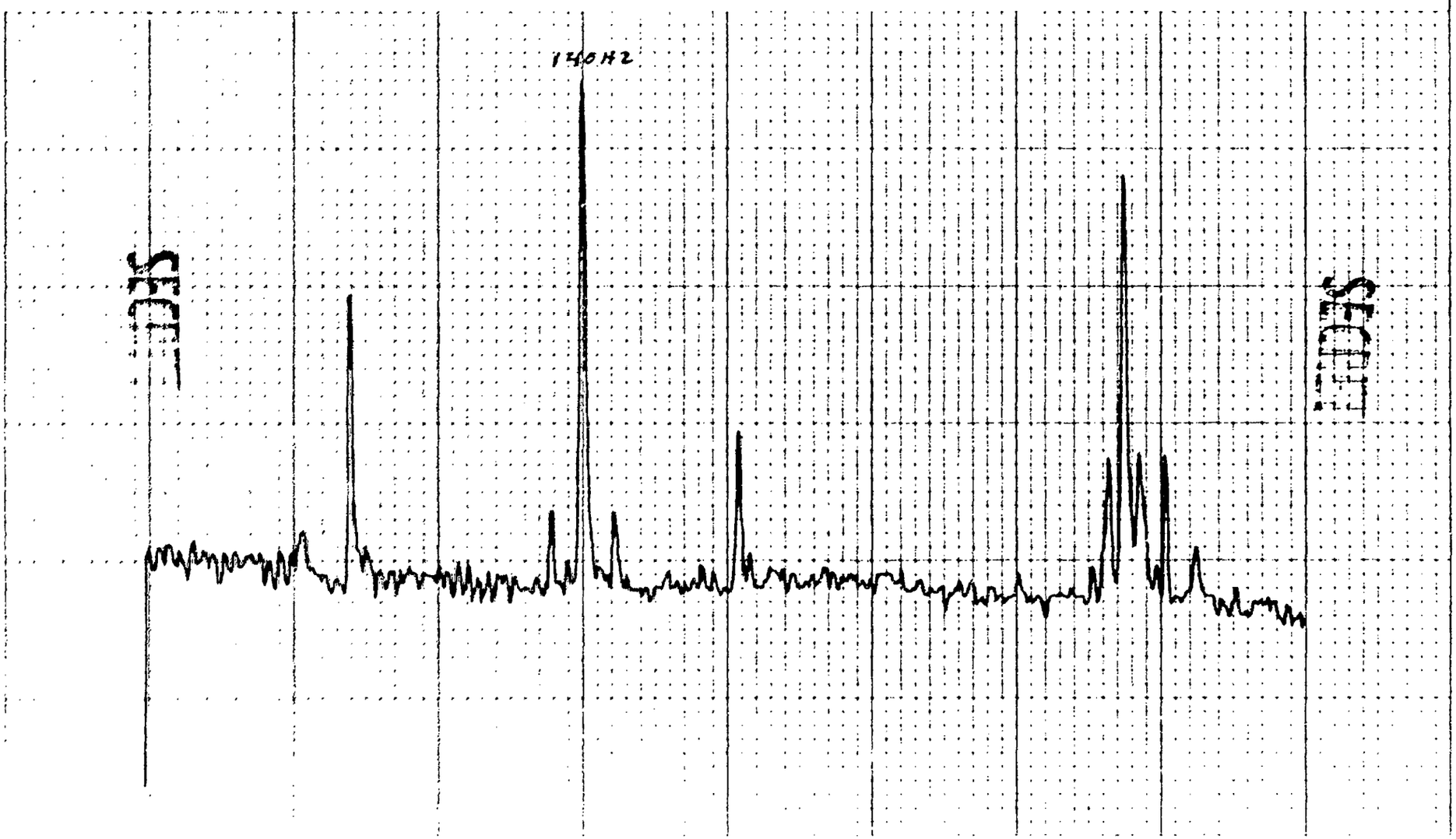
46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+23 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -10 DB
WTG: HANNING



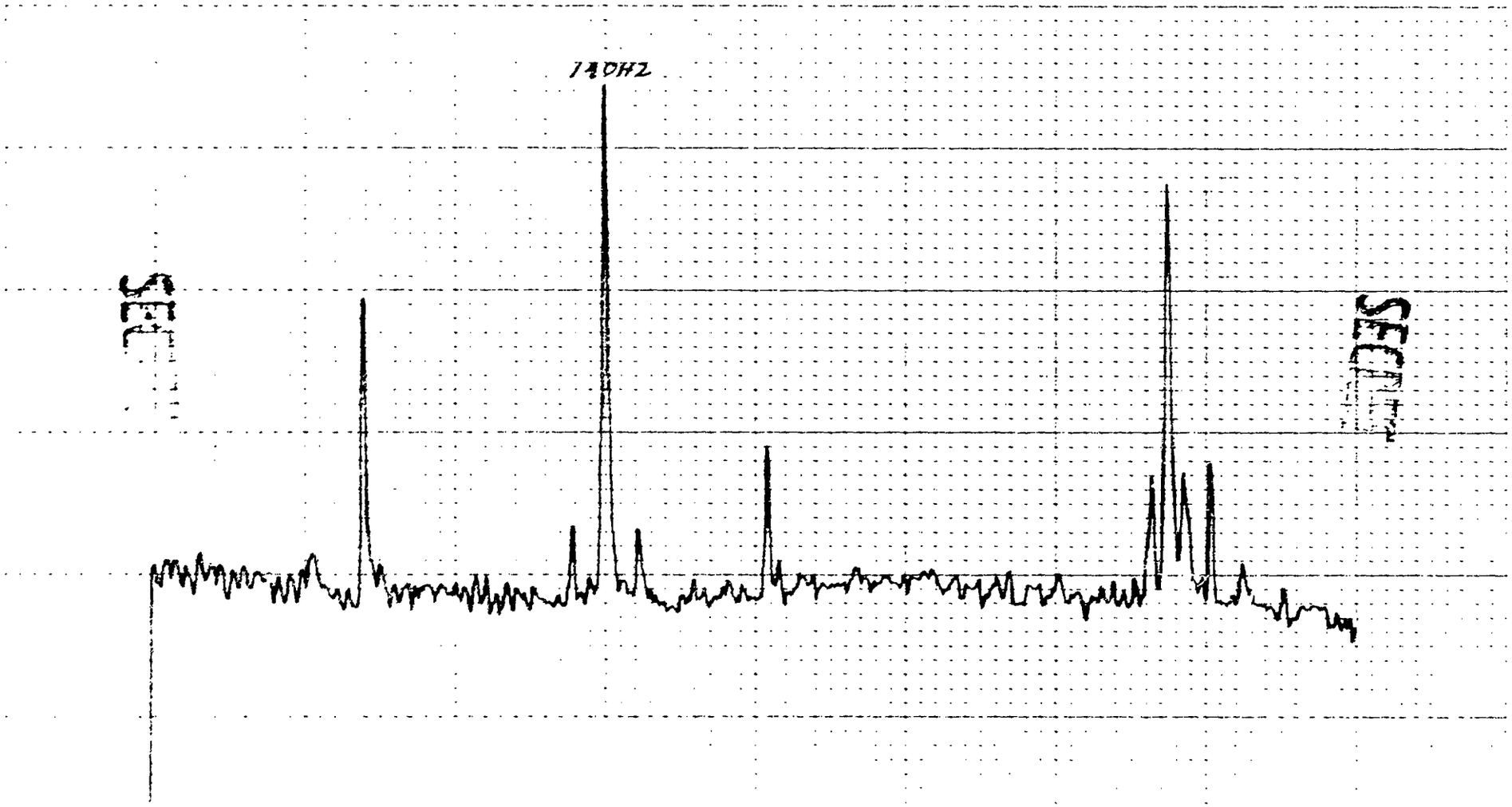
46 0703

CONTROL: 1501 - 16 (DP8)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3 15 77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+25 DEG. AZ STEERING

REEL: 14
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -18 DB
WTG: HANNING



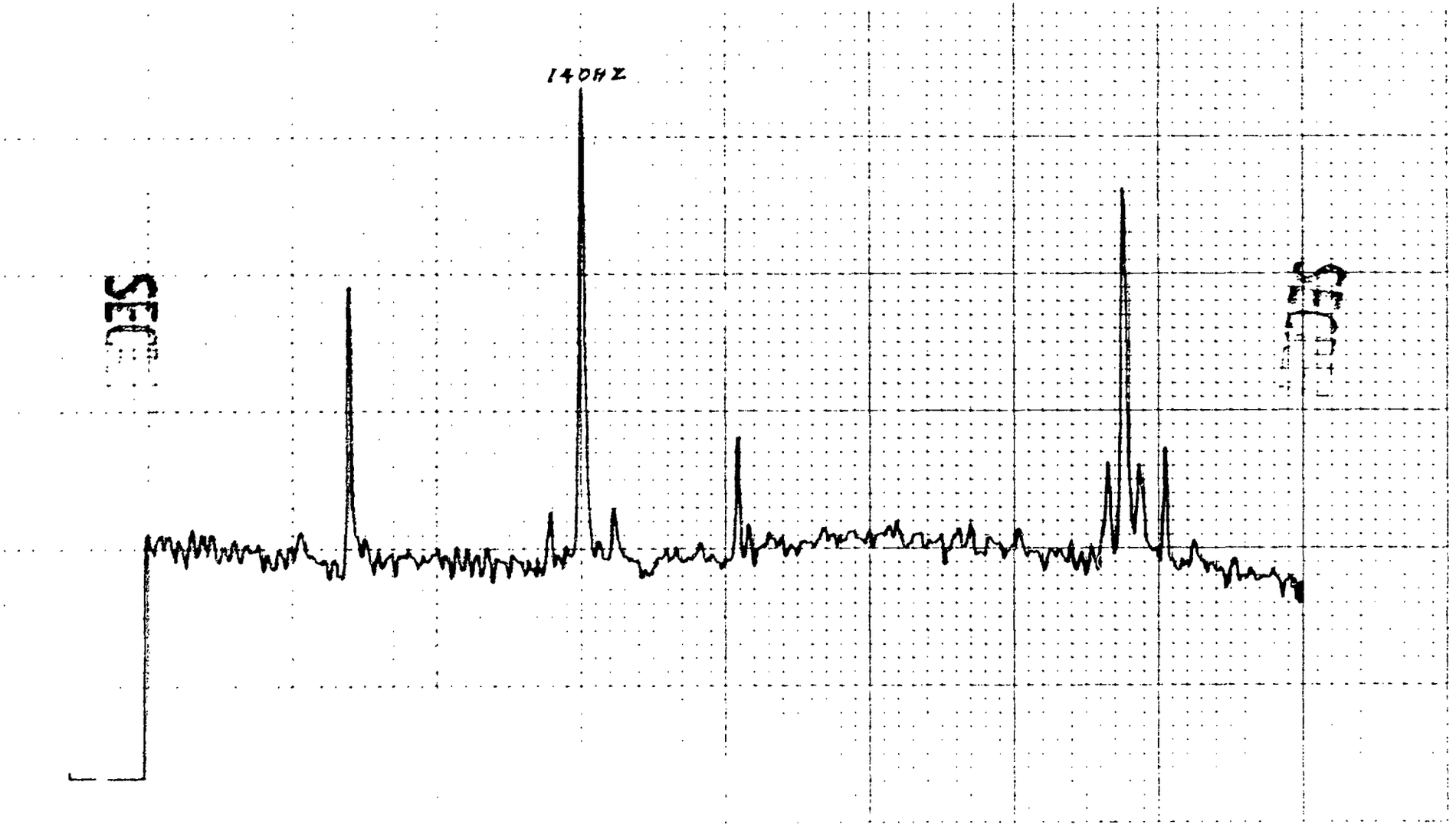
46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 7-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+27 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -10 DB
WTG: HANNING



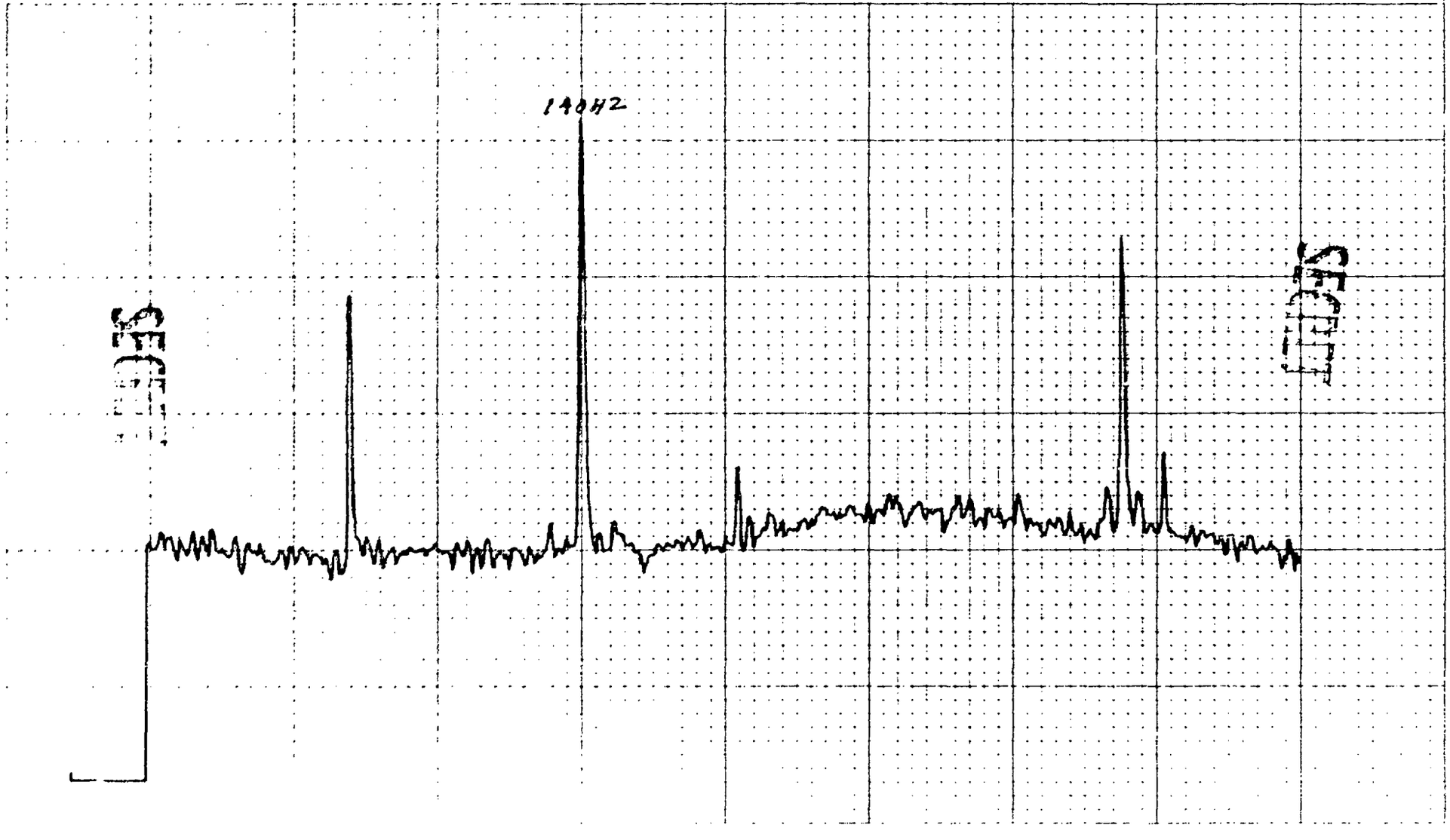
46 0703

CONTROL: 1501 - 16 (D98)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+29 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -18 DB
WTG: HANNING



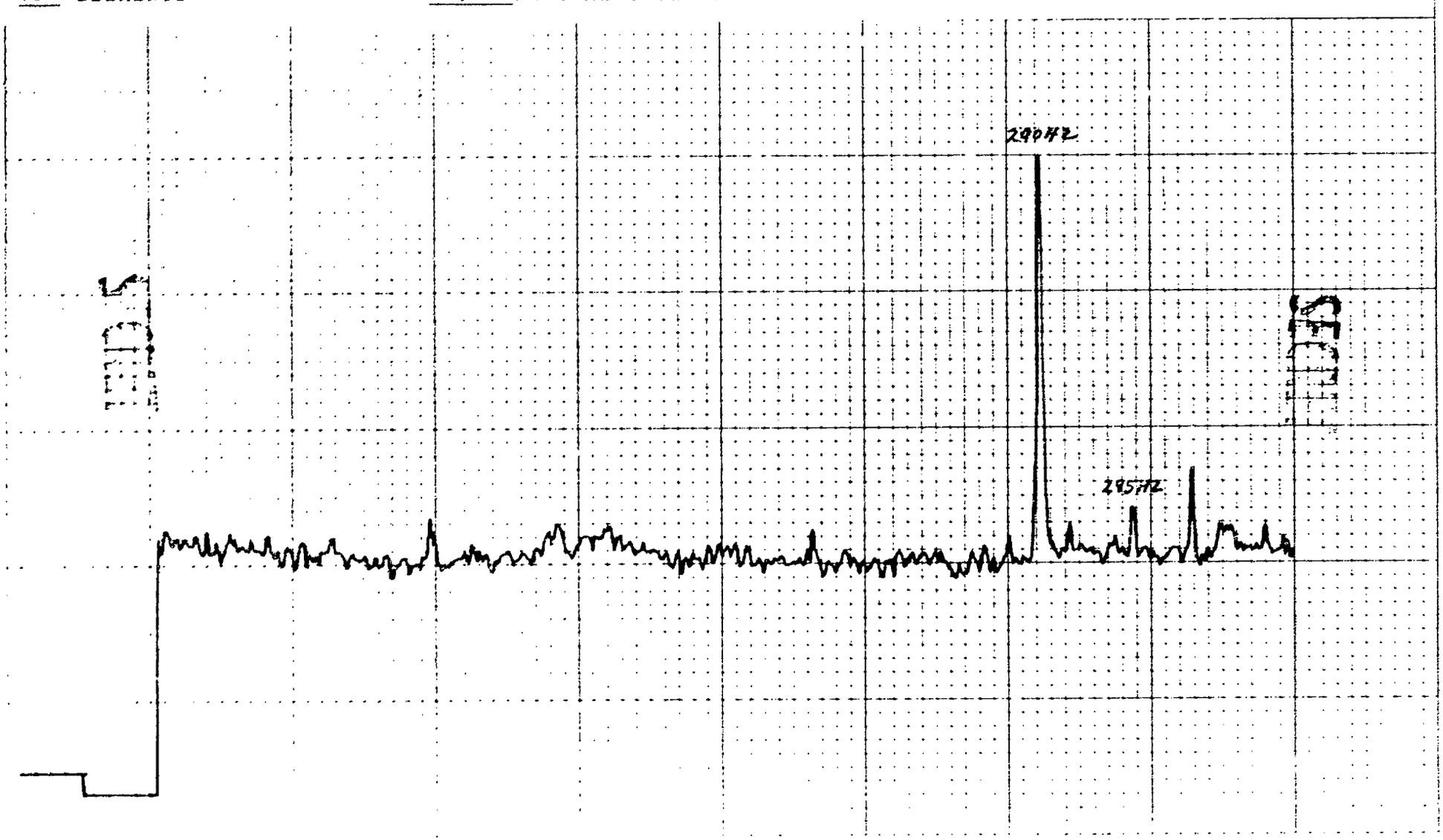
46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+7 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -18 DB
WTG: HANNING

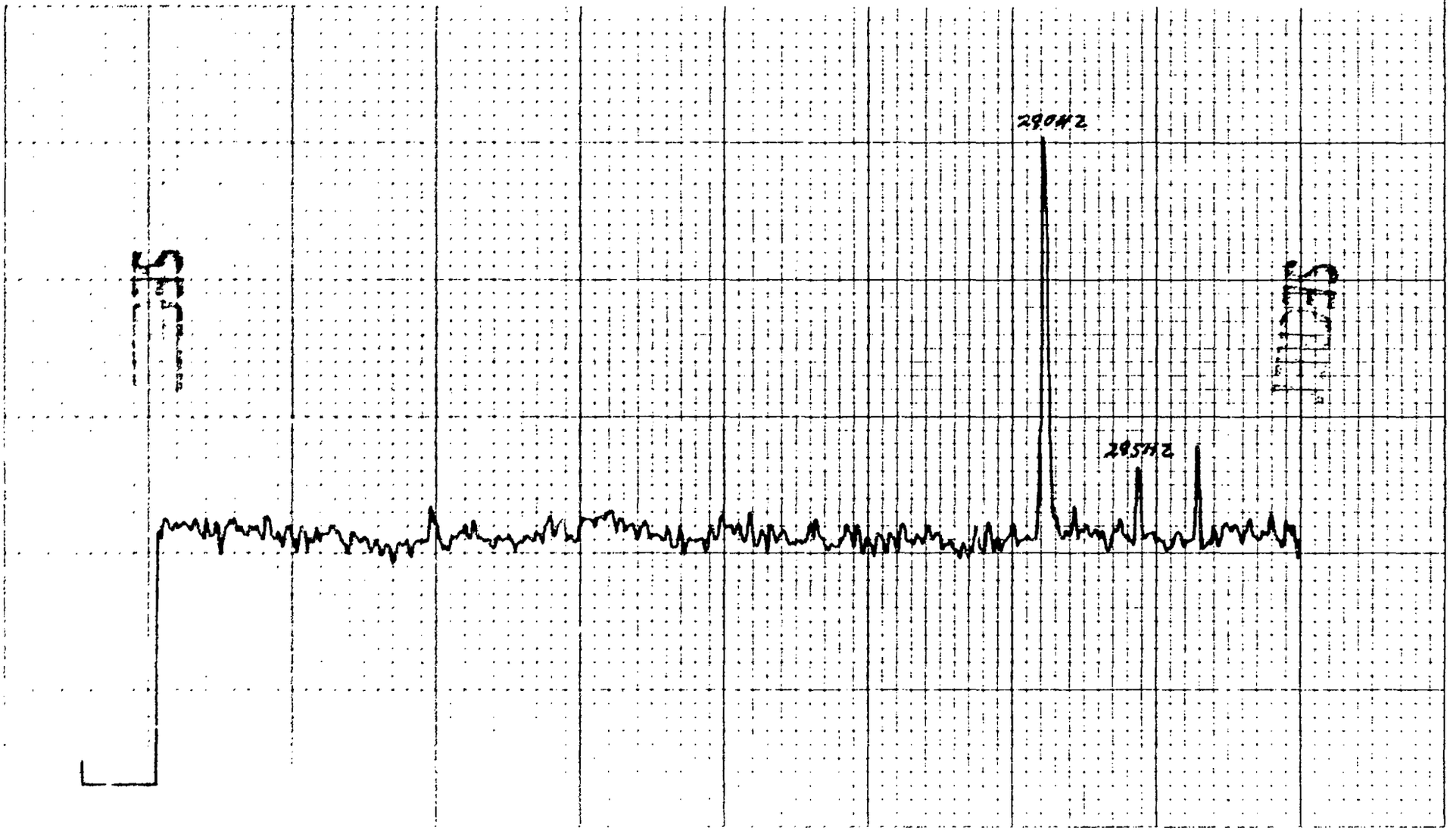


CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+9 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -18 DB



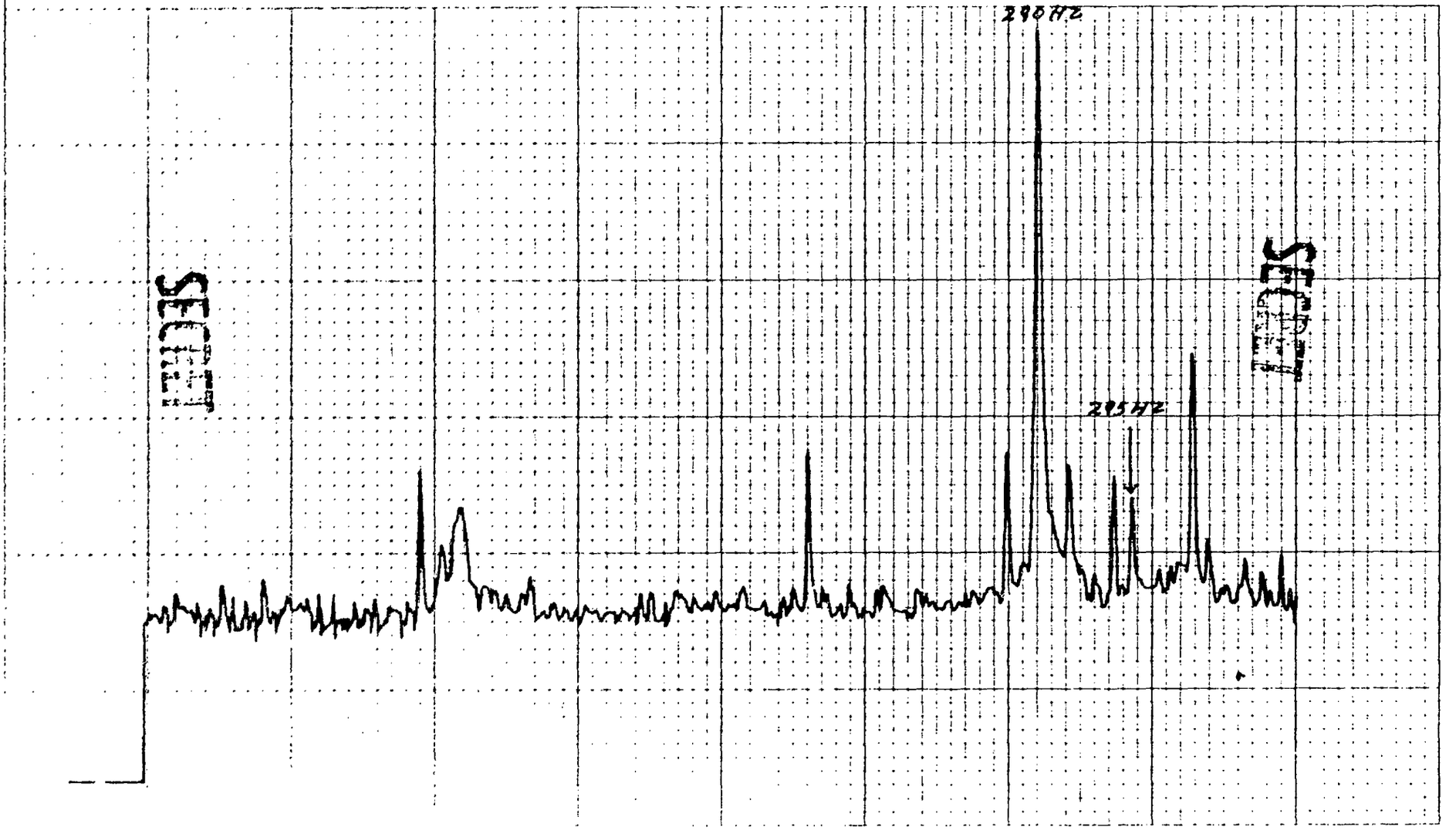
46 0703

CONTROL: 1501 - 48 (DIB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-15-77-1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+11 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX C3000
ATTEN: 18 DB

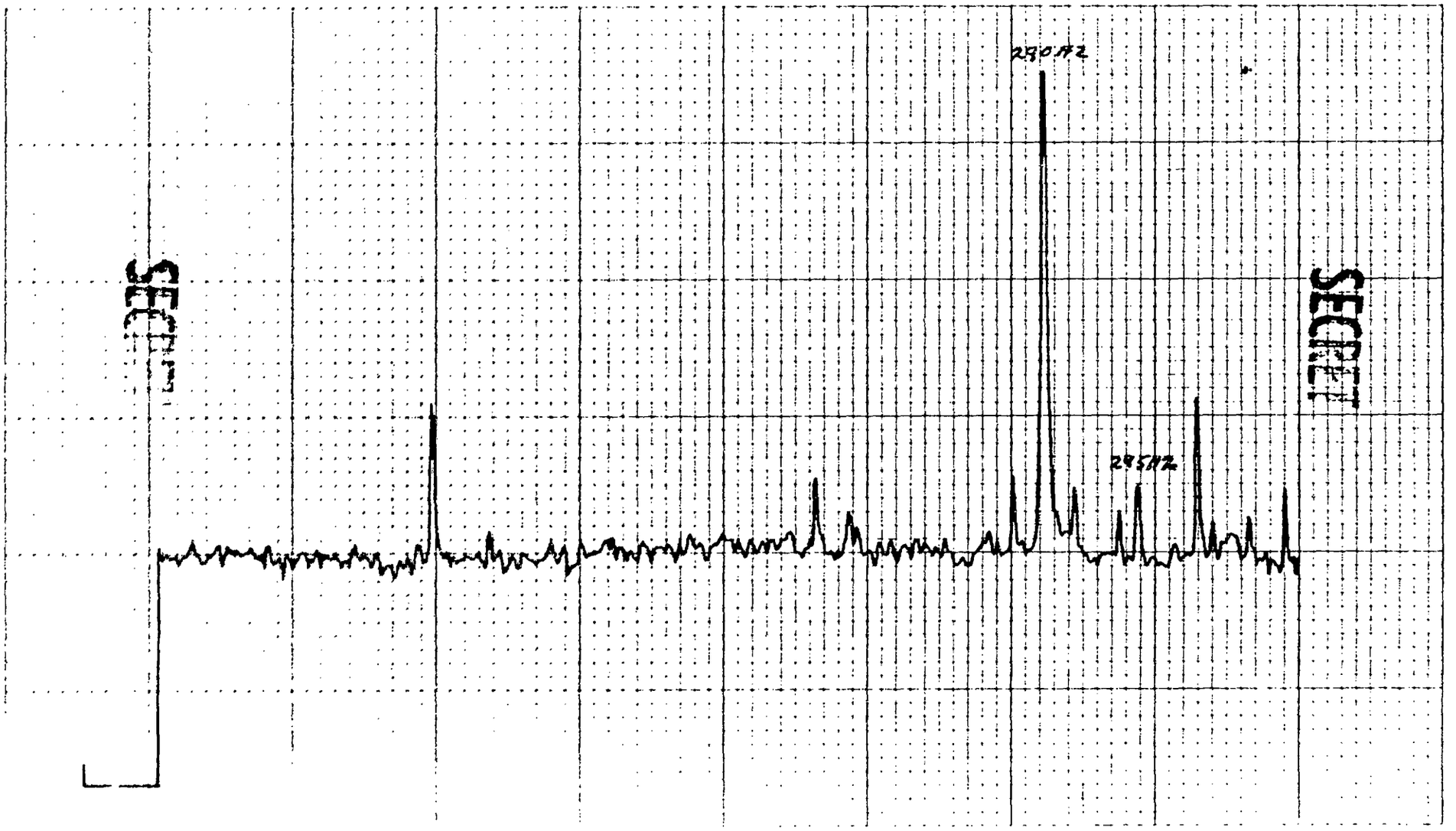


CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-72-1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+13 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -18 DB



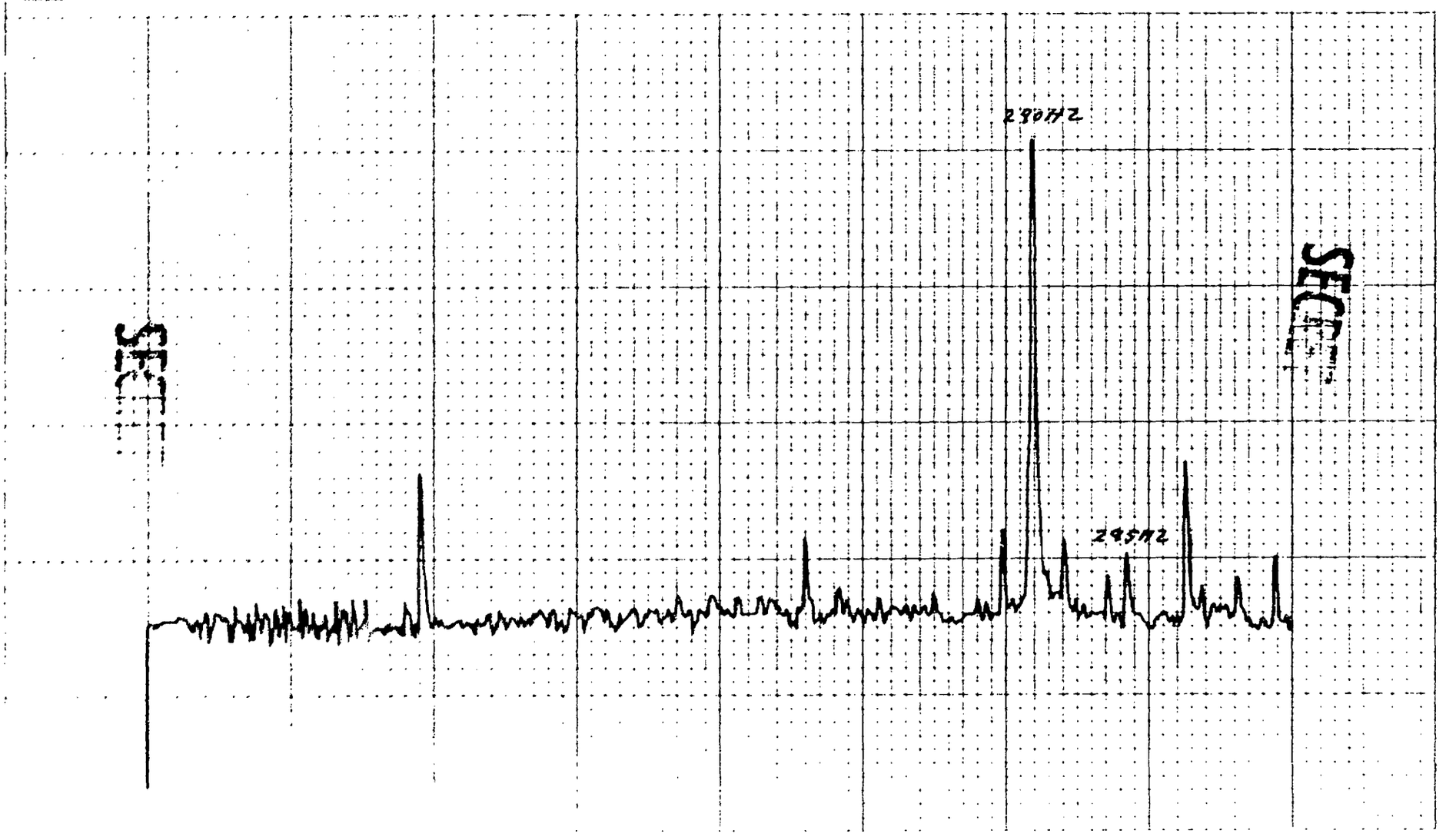
46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-72 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+15 DEG. AZ STEERING

REEL: 14
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -18 DB



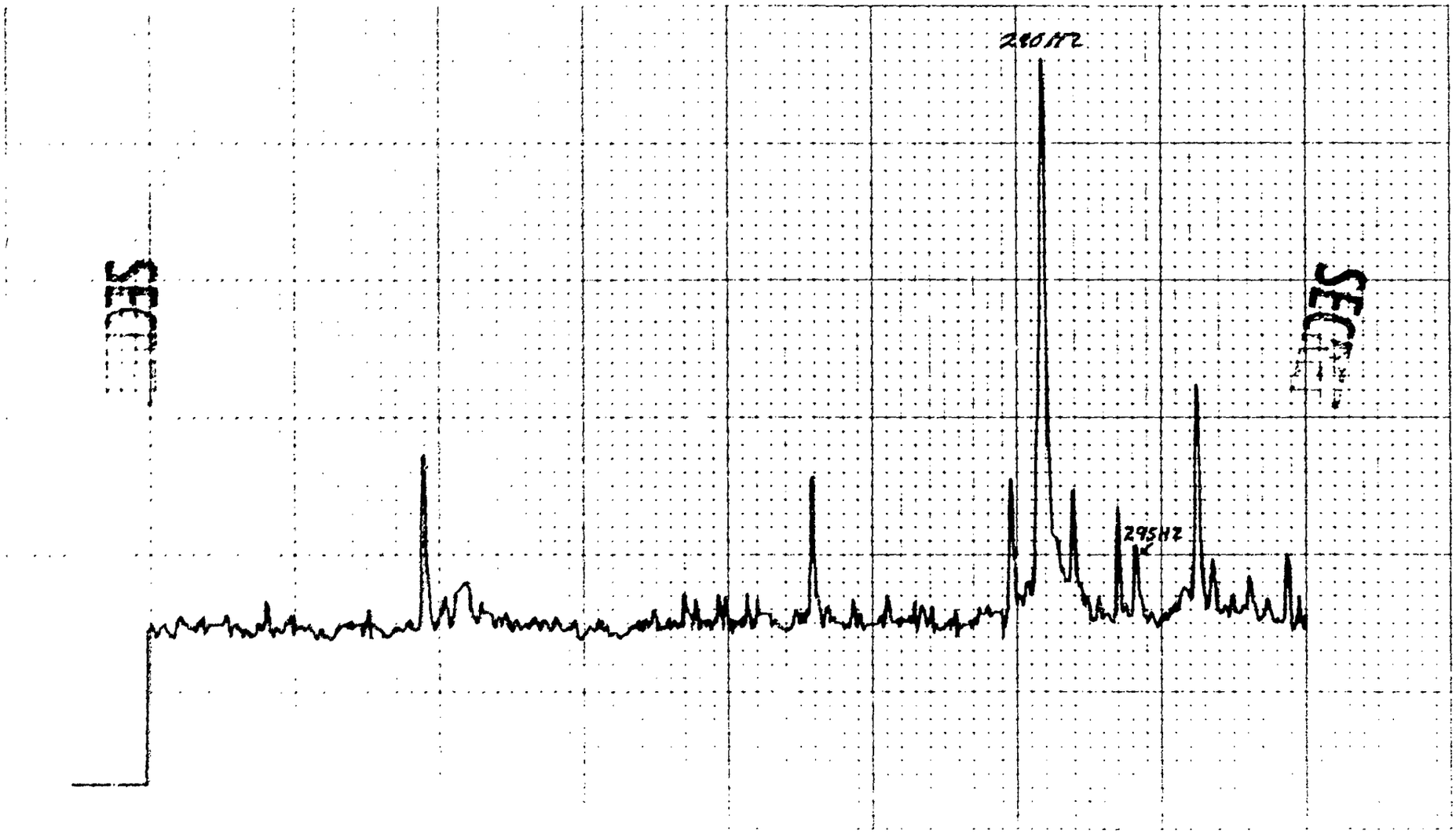
46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+17 DEG. AZ STEERING

REEL: 14
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 300c
ATTEN: -18 DB

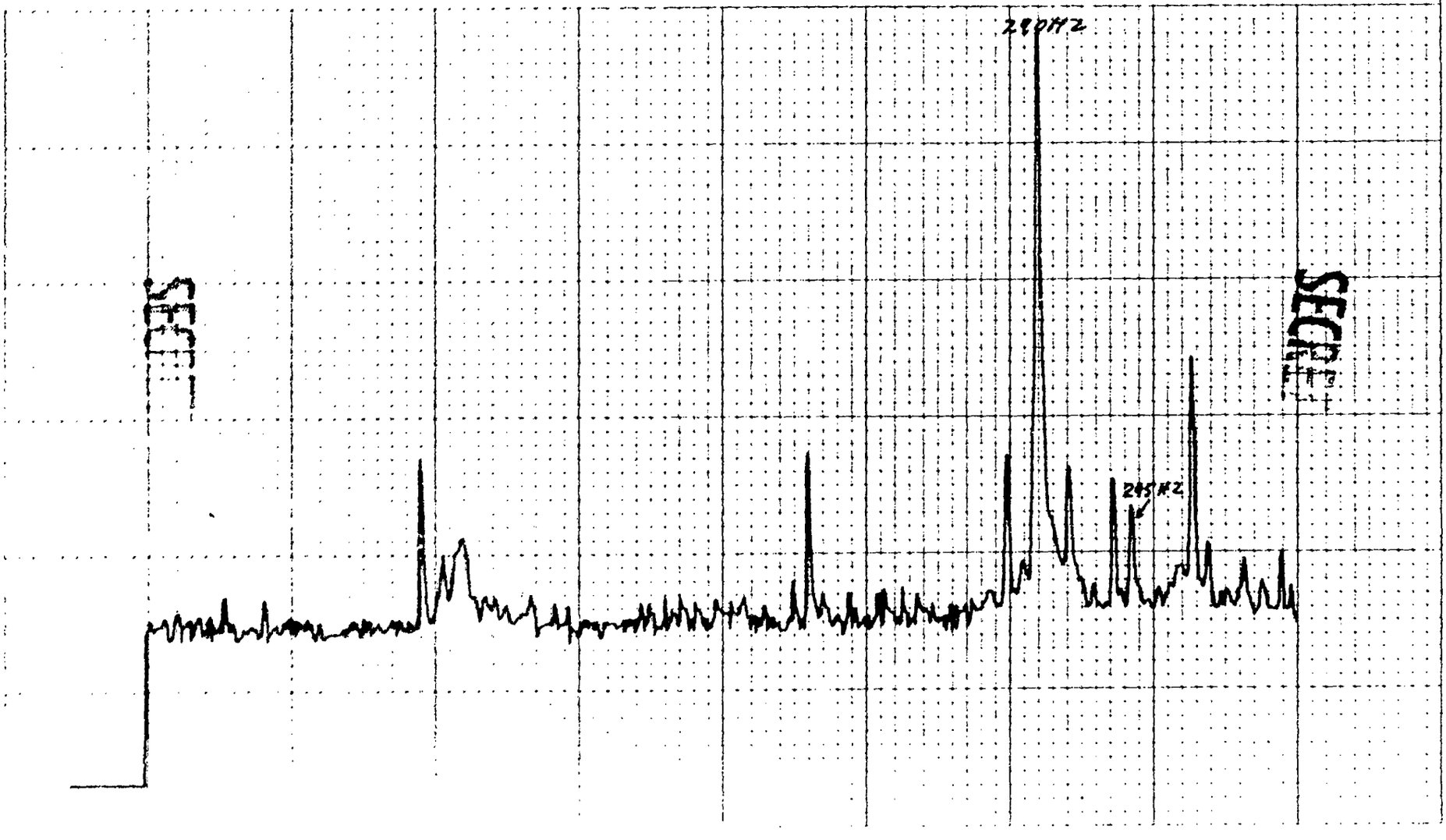


CONTROL: 1501 - 16 (288)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+19 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -18 DB



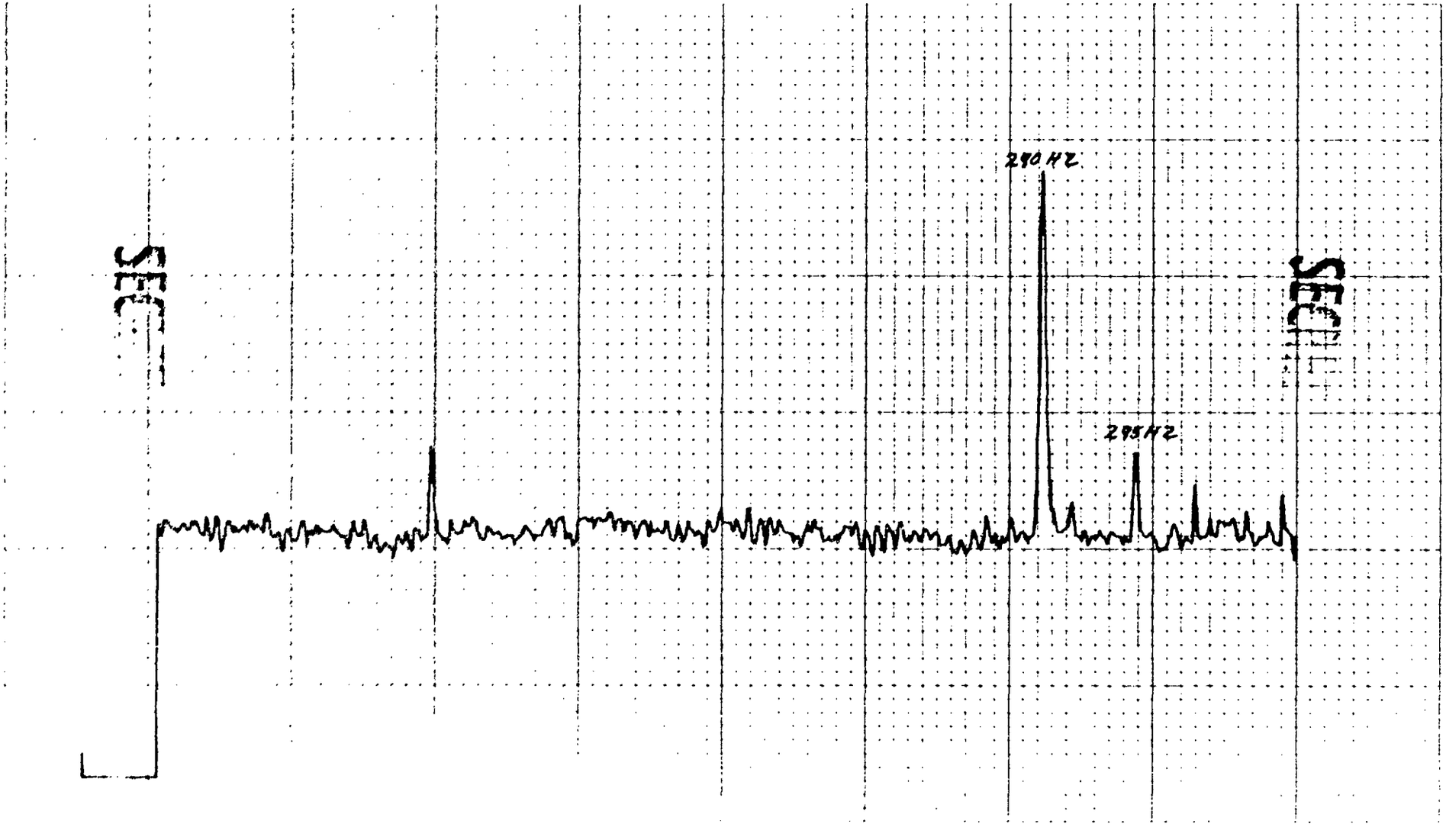
46 0703

CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+20 DEG. AZ STEERING

REEL: __ INDEX ____

INTEGRATION TIME 320 SECS ATTEN: ___ DB
FILTER WTG: HANNING



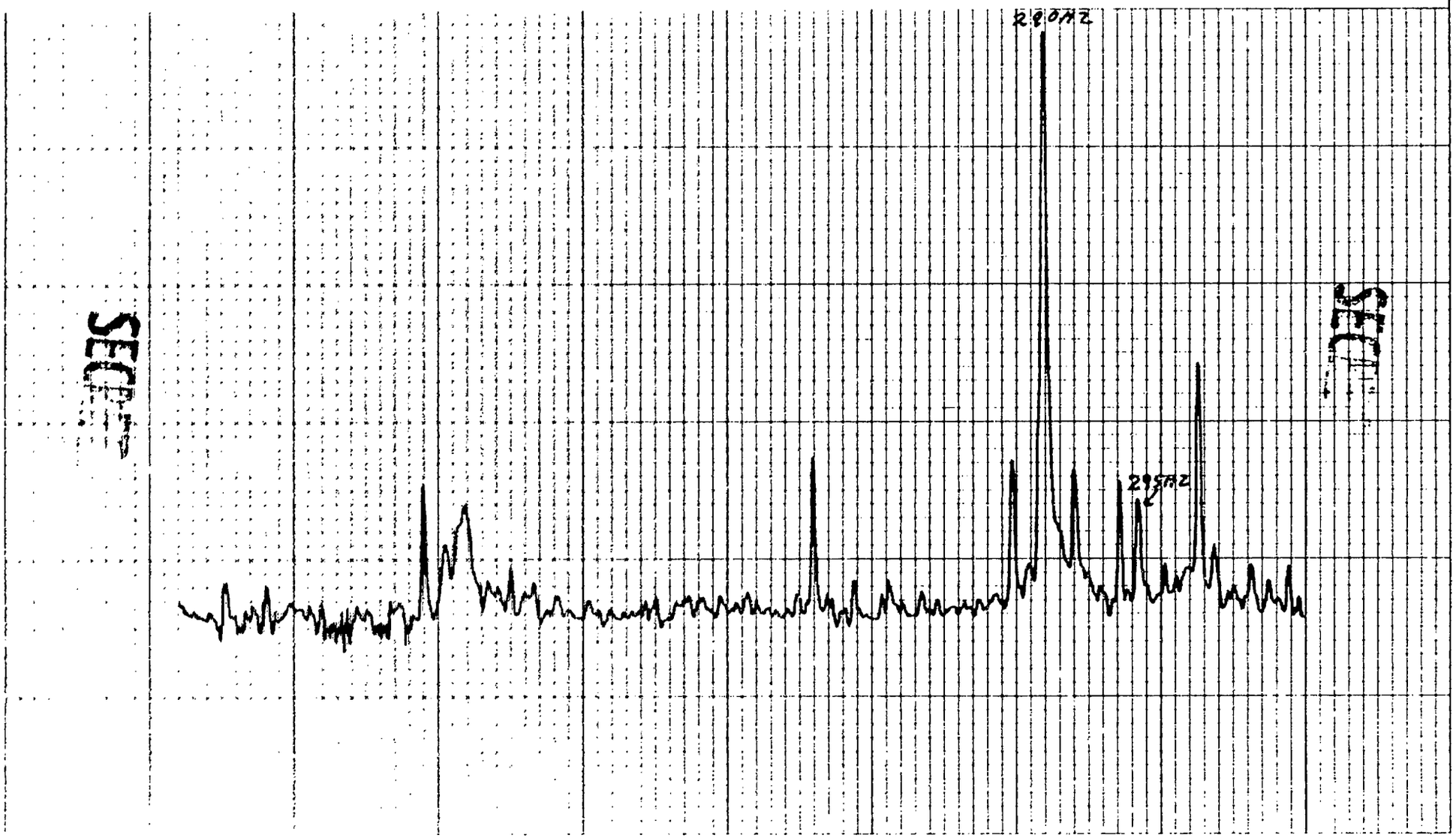
46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+21 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -18 DB

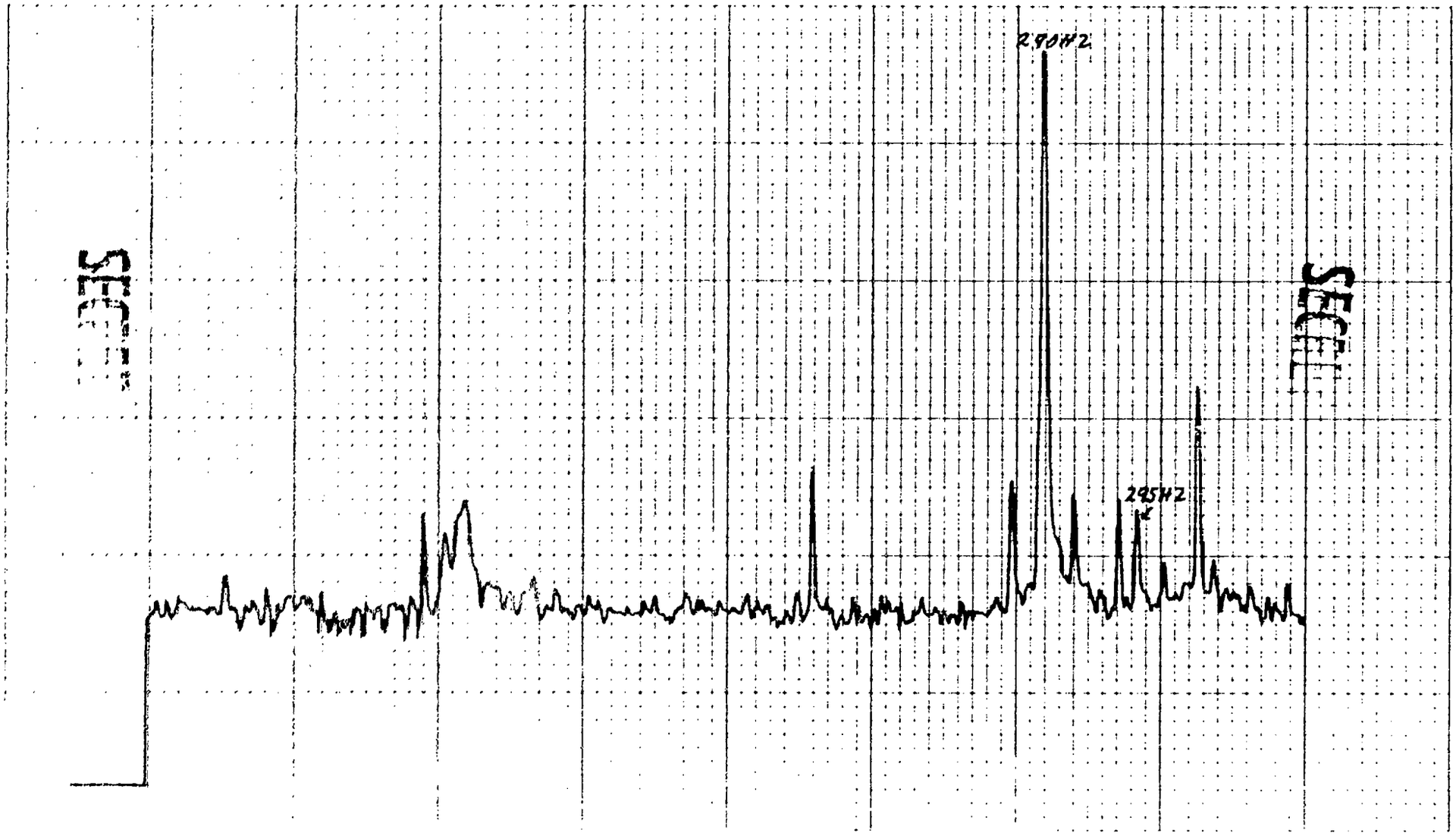


CONTROL: 1501 - 16 (DPO)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+23 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -18 DB
WTG: HANNING

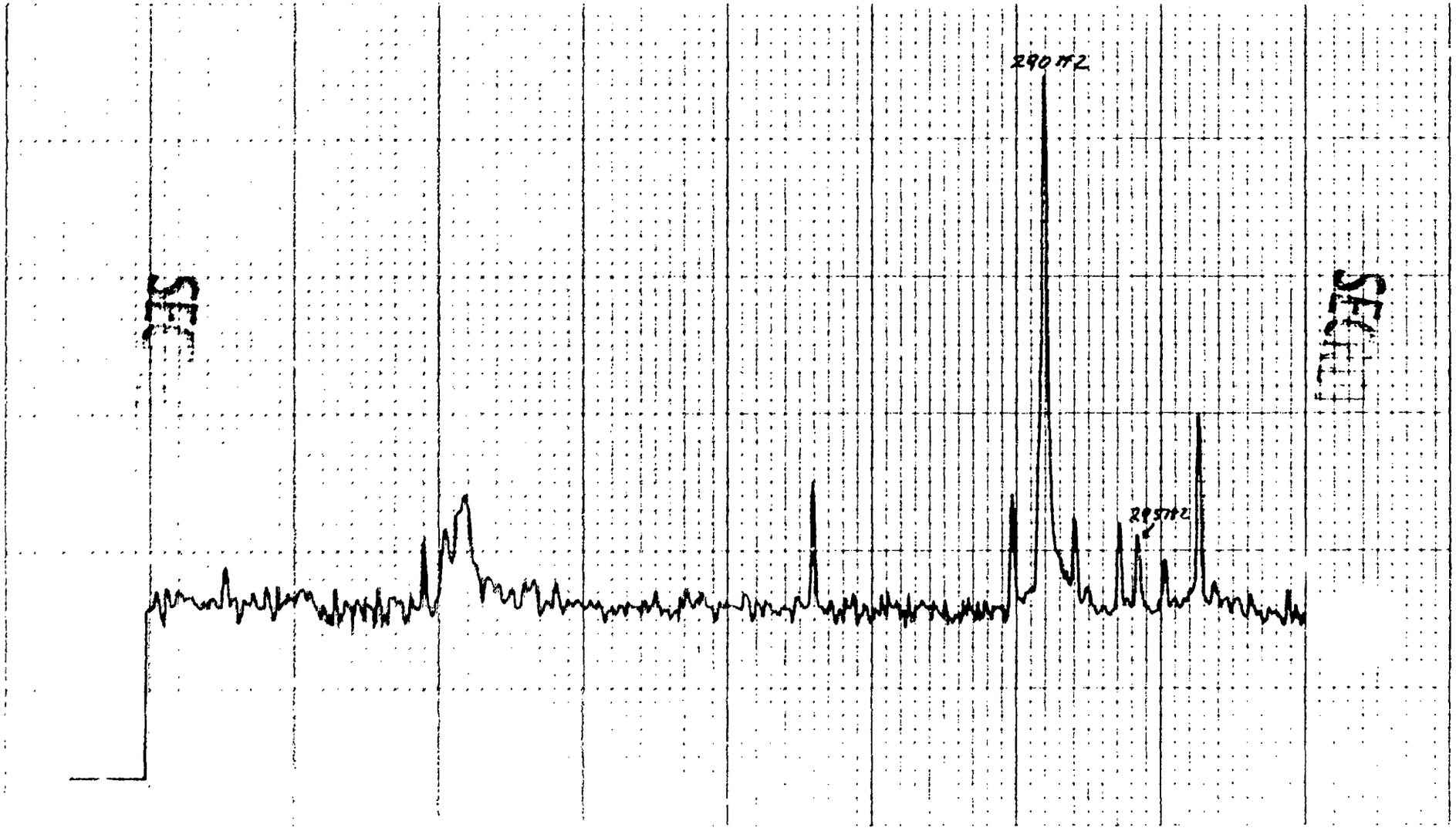


46 0703

CONTROL: 1501 - 16 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3 FEB 77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+25 DEG. AZ STEERING

REEL: M4 INDEX 3000
INTEGRATION TIME 320 SECS ATTEN: 78 DB
FILTER WTG: HANNING



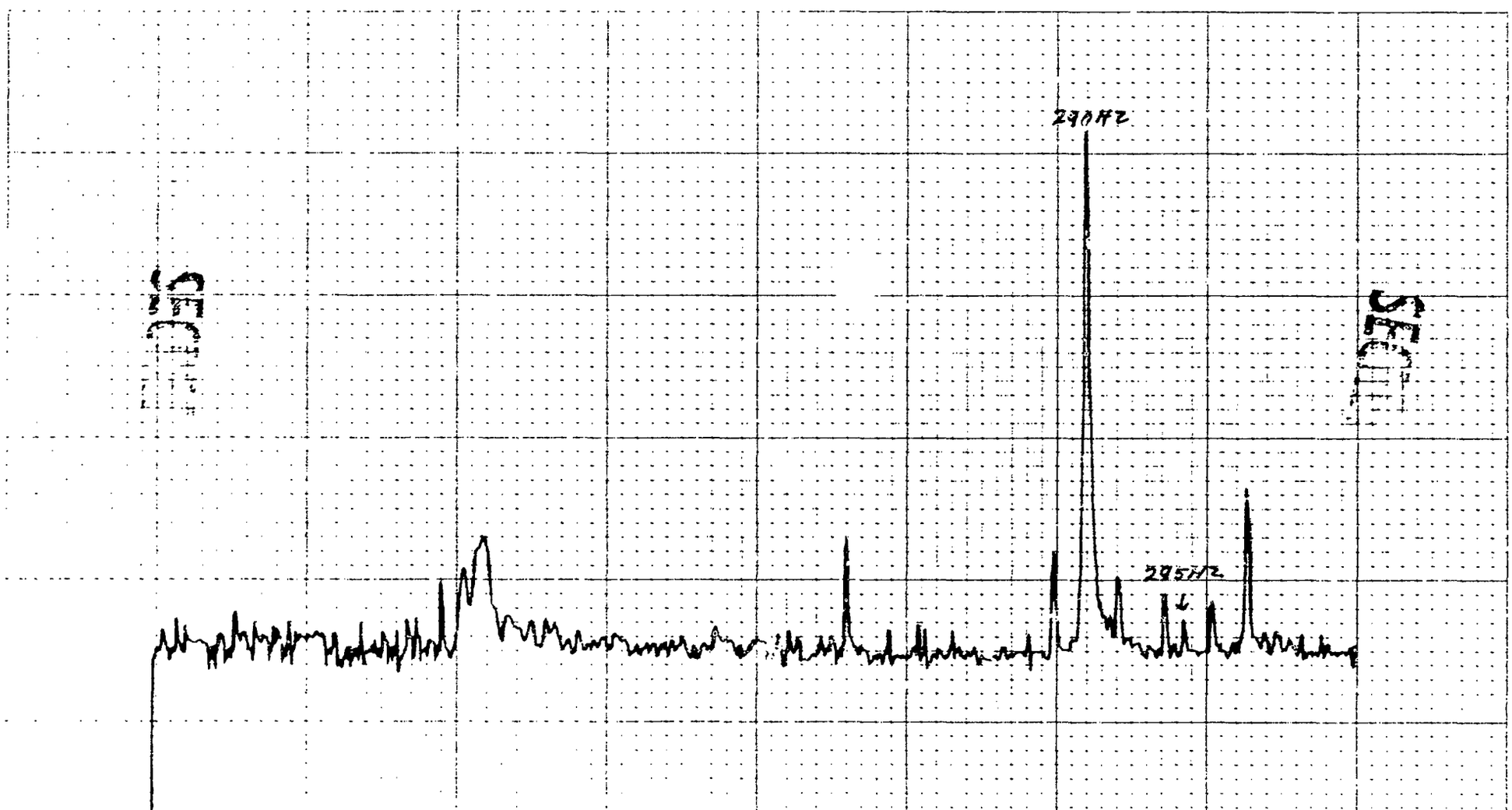
46 0703

CONTROL: 1501 - 16 (DPS)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE:BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501Z
ANALYSIS BANDWIDTH: 1/10HZ
+27 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -18 DB
WTG: HANNING



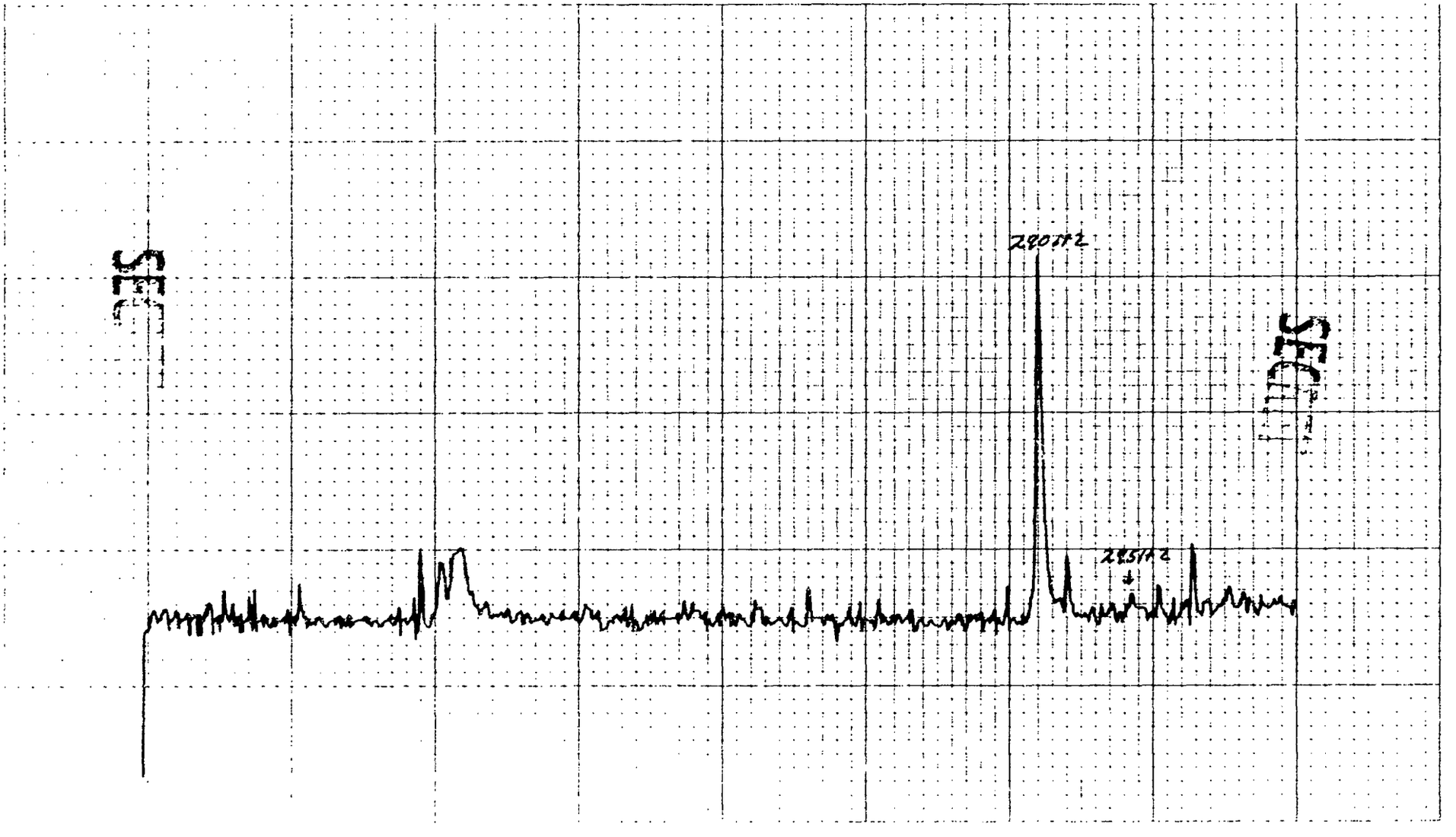
46 0703

CONTROL: 1501 - 16 (DP8)
BEAMFORMED SPECTRUM(ELEMENTS 29-44)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+29 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 1501
ATTEN: -18 DB
WTG: HANNING



CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 8 FREQUENCY 140 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-27.2	
MCPS-32 CAL. CORRECTION	+10	-17.2	
BEAMFORMER GAIN	+30	+12.8	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .2	+13	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-75.1	
MCPS-32 CAL. CORRECTION	+10	-65.1	
BEAMFORMER GAIN	+30	-35.1	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+12.8	
SIGNAL LEVEL FOR SNR	-35.1	47.9	
PROCESSOR CORRECTION	-4.0	43.9	
MRA CORRECTION	+ .2	44.1	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	35.9	SNR 1 HZ BAND

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CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 8 FREQUENCY 290 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-23.8	
MCPS-32 CAL. CORRECTION	+10	-13.8	
BEAMFORMER GAIN	+30	+16.2	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	+17	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-75.2	
MCPS-32 CAL. CORRECTION	+10	-65.2	
BEAMFORMER GAIN	+30	-35.2	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+16.2	
SIGNAL LEVEL FOR SNR	-35.2	51.4	
PROCESSOR CORRECTION	-4.0	47.4	
MRA CORRECTION	+ .8	48.2	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	40.0	SNR 1 HZ BAND

CONFIDENTIAL

SECTION 8

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 8 FREQUENCY 295 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-60.4	
MCPS-32 CAL. CORRECTION	+10	-50.4	
BEAMFORMER GAIN	+30	-20.4	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	-19.6	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-74.4	
MCPS-32 CAL. CORRECTION	+10	-64.4	
BEAMFORMER GAIN	+30	-34.4	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-20.4	
SIGNAL LEVEL FOR SNR	-34.4	14	
PROCESSOR CORRECTION	-4.2	9.8	
MRA CORRECTION	+ .8	10.6	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	2.4	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 8

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-19.4	-15.2	
MRA SIGNAL LEVEL	+13.0	+17.0	-19.6
ARRAY SIGNAL GAIN	32.4	32.3	
20 LOG 32 (# of elements)	30.1	30.1	
DIFFERENCE	+ 2.3	+2.2	

ARRAY GAIN

MRA SNR	44.1	48.2	10.6
MEAN OMNI SNR	29.4	35.4	
ARRAY GAIN	14.7	12.8	
THEORETICAL AZMUTH GAIN (at MRA)	13.4	15.2	14.7
DIFFERENCE	+ 1.3	- 2.4	

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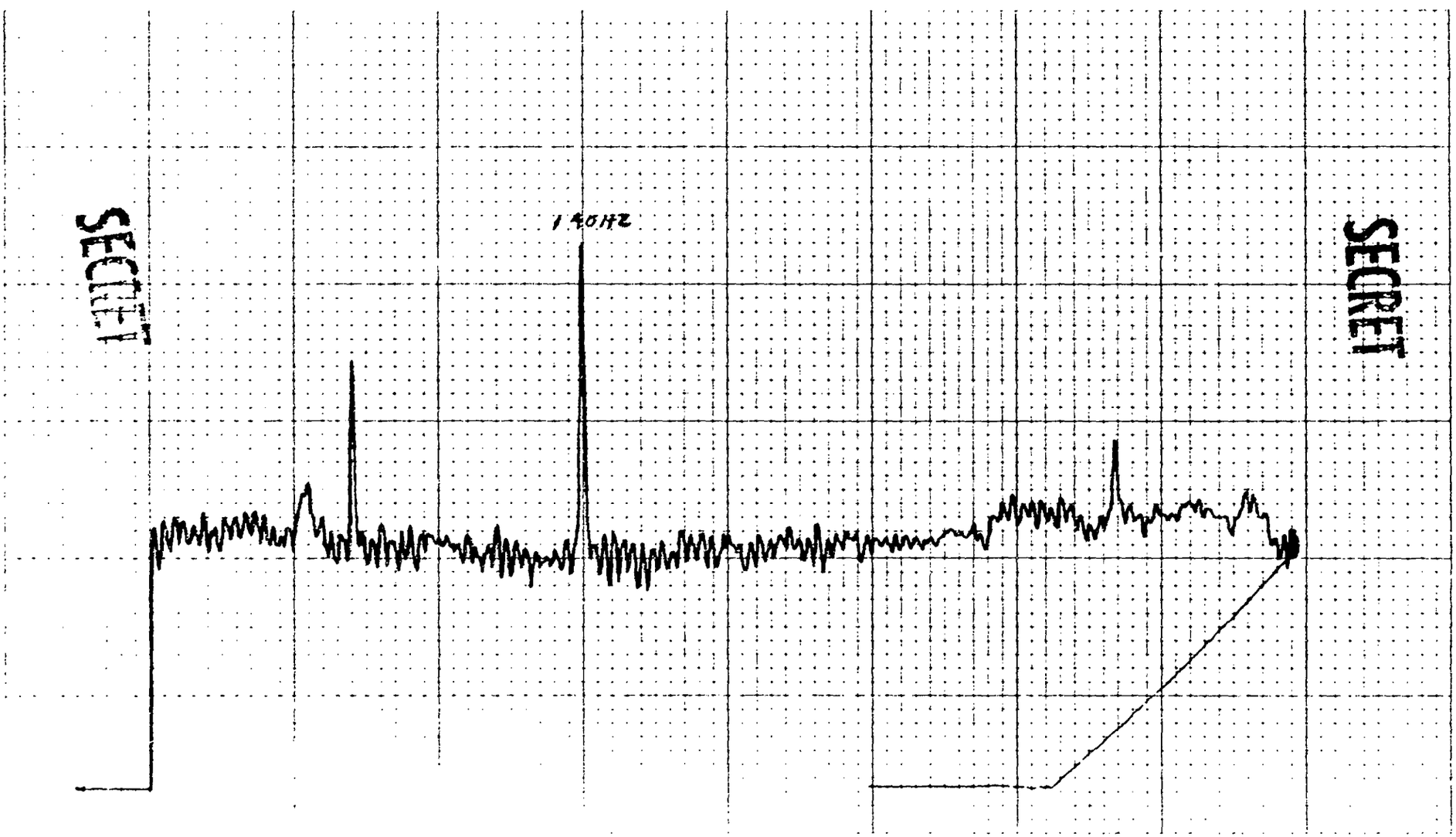
46 0703

CONTROL: 1501 - 32 (DP8)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+10 DEG. AZ STEERING

REEL: M4
INDEX 3000

INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH

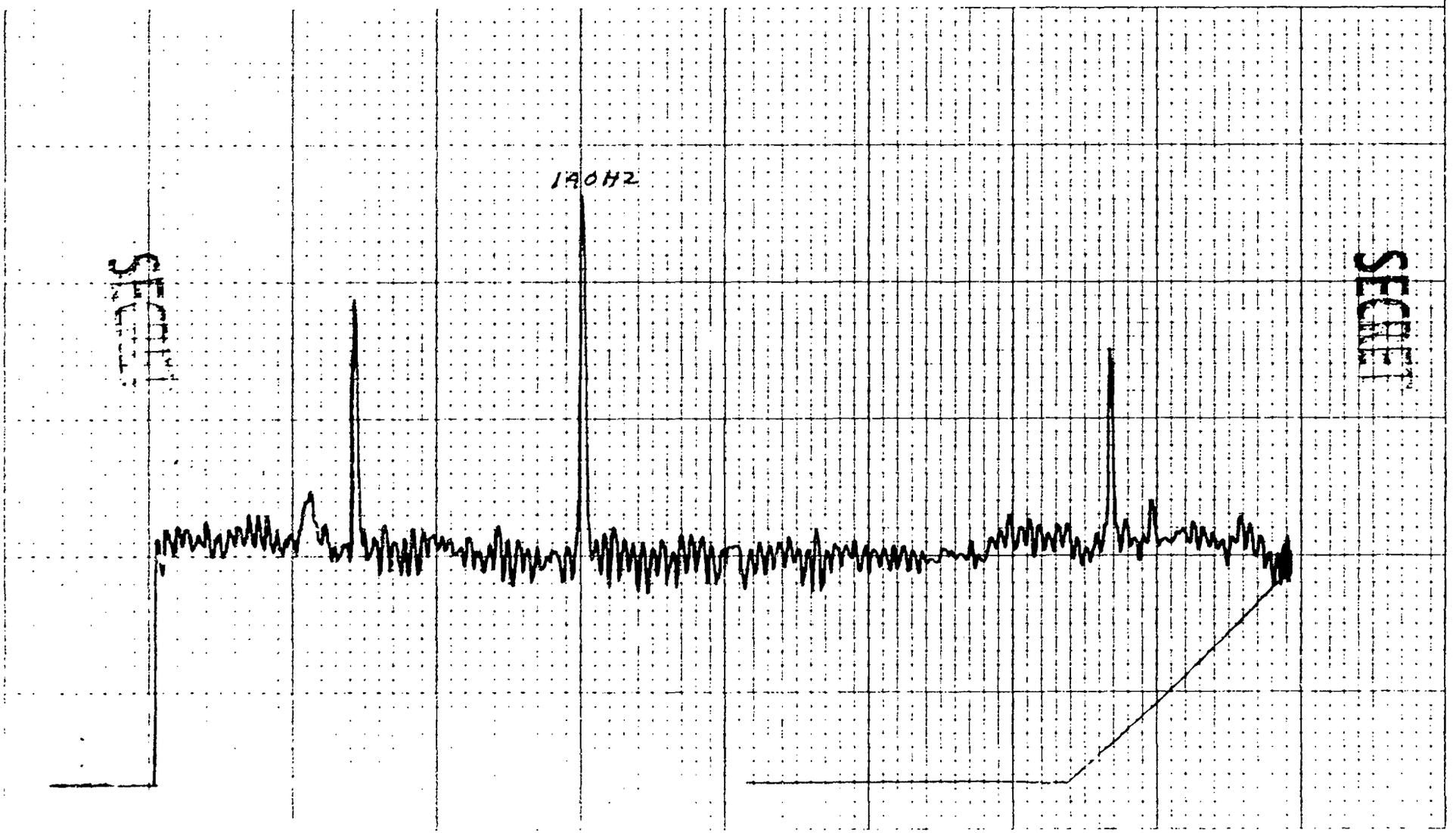
46 0703

CONTROL: 1501 - 32 (DP8)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
20-26 Ø 29-53)
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+12 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: 30 DB

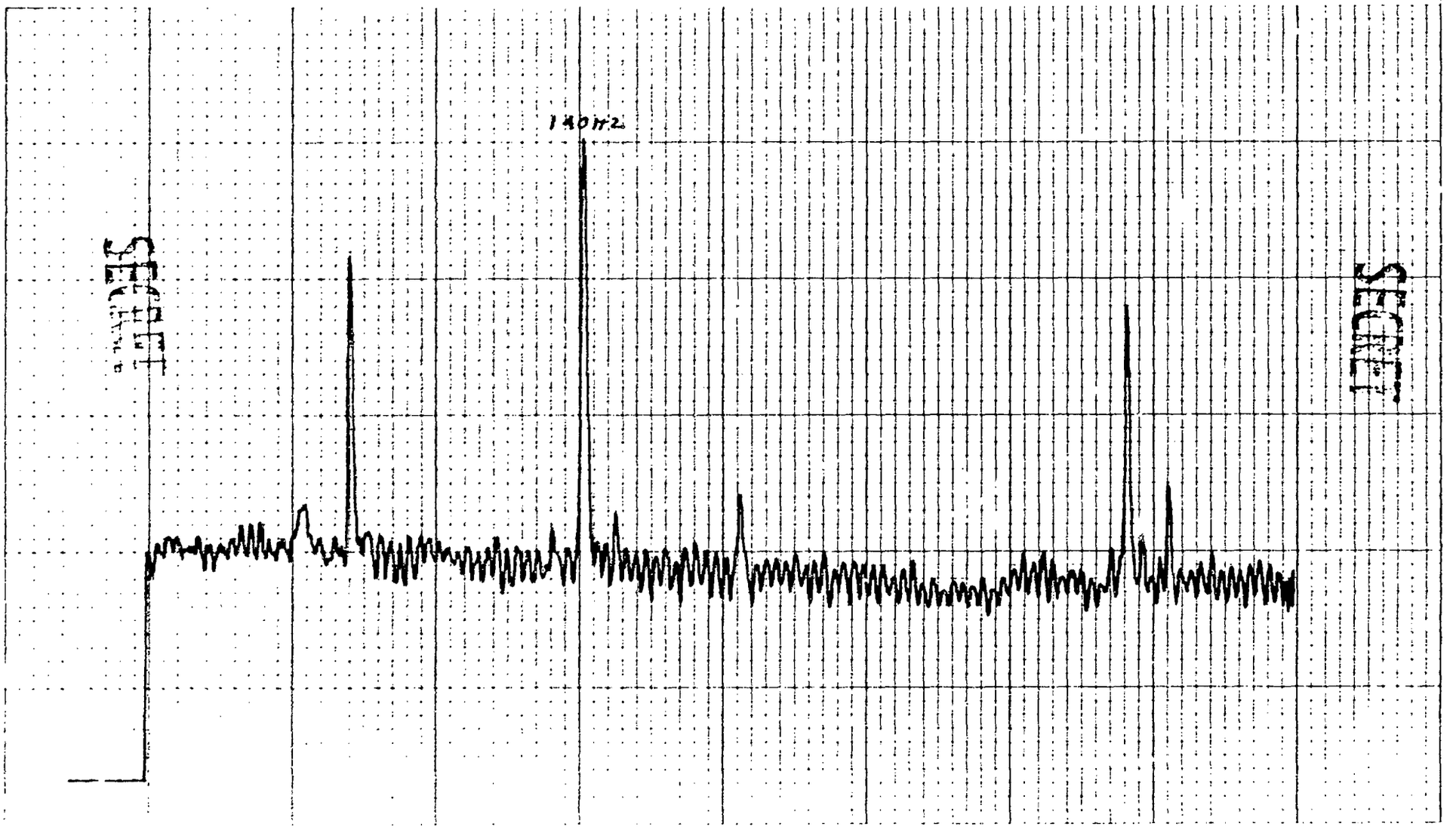


CONTROL: 1501 - 32 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 09-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+14 DEG. AZ STEERING

REEL: M 4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -30 DB
WTG: HANNING



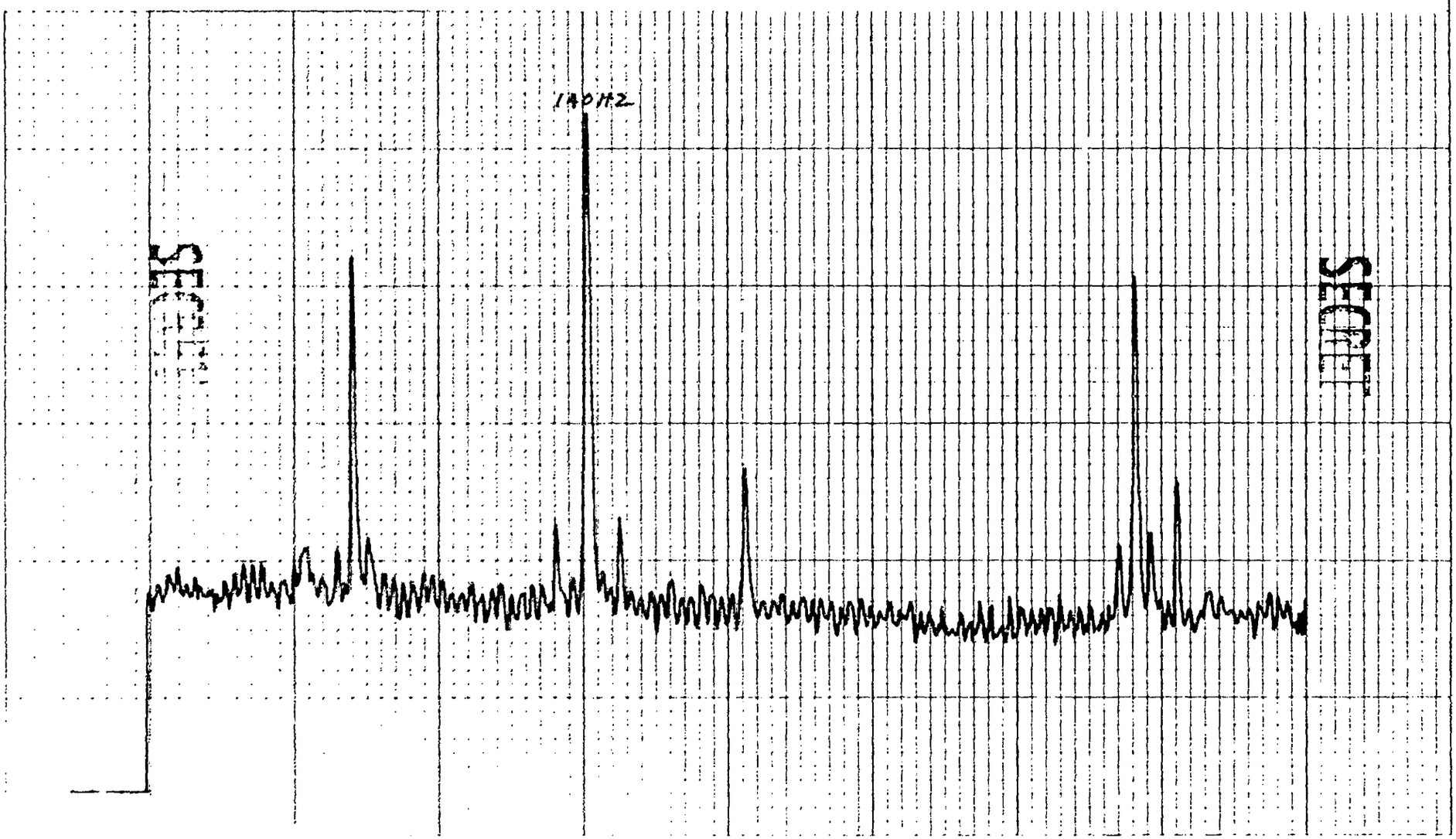
46 0703

CONTROL: 1501 - 32 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+16 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB



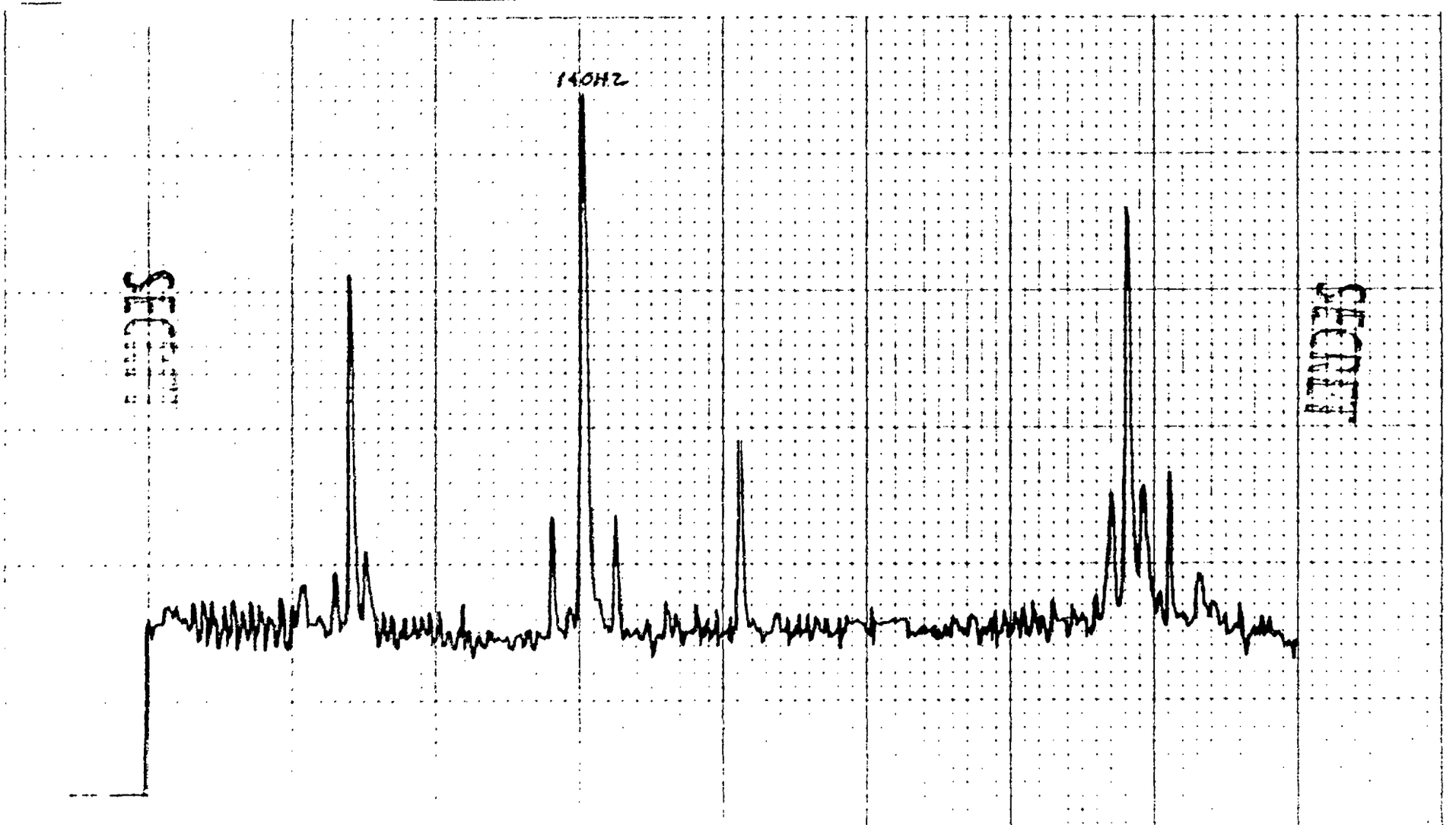
46 0703

CONTROL: 1501 - 32 (DPO)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+18 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 300c
ATTEN: -30 DB



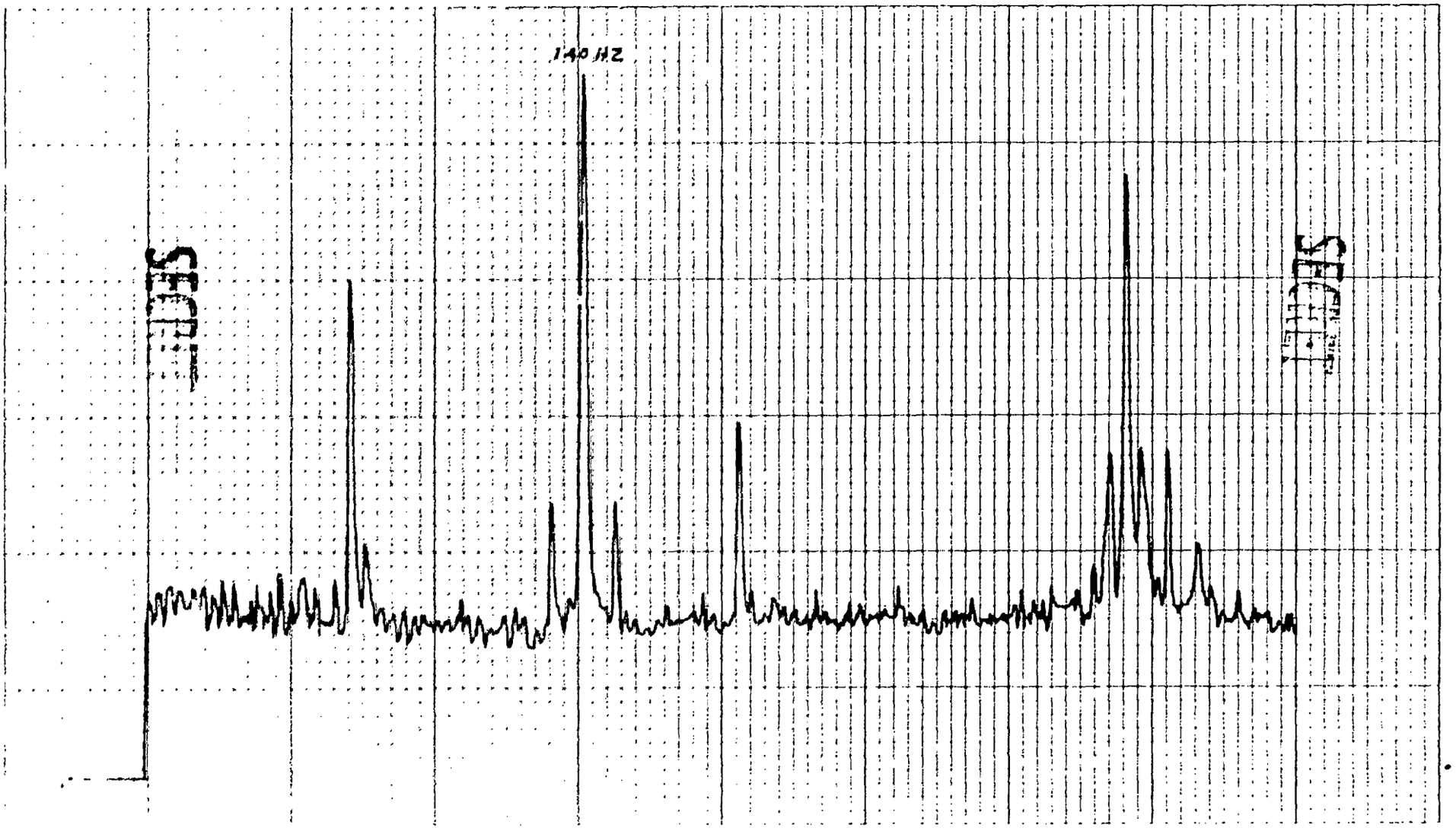
K+E 10 X 10 TO THE INCH 46 0703

CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+20 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3100
ATTEN: 30 DB



K+E

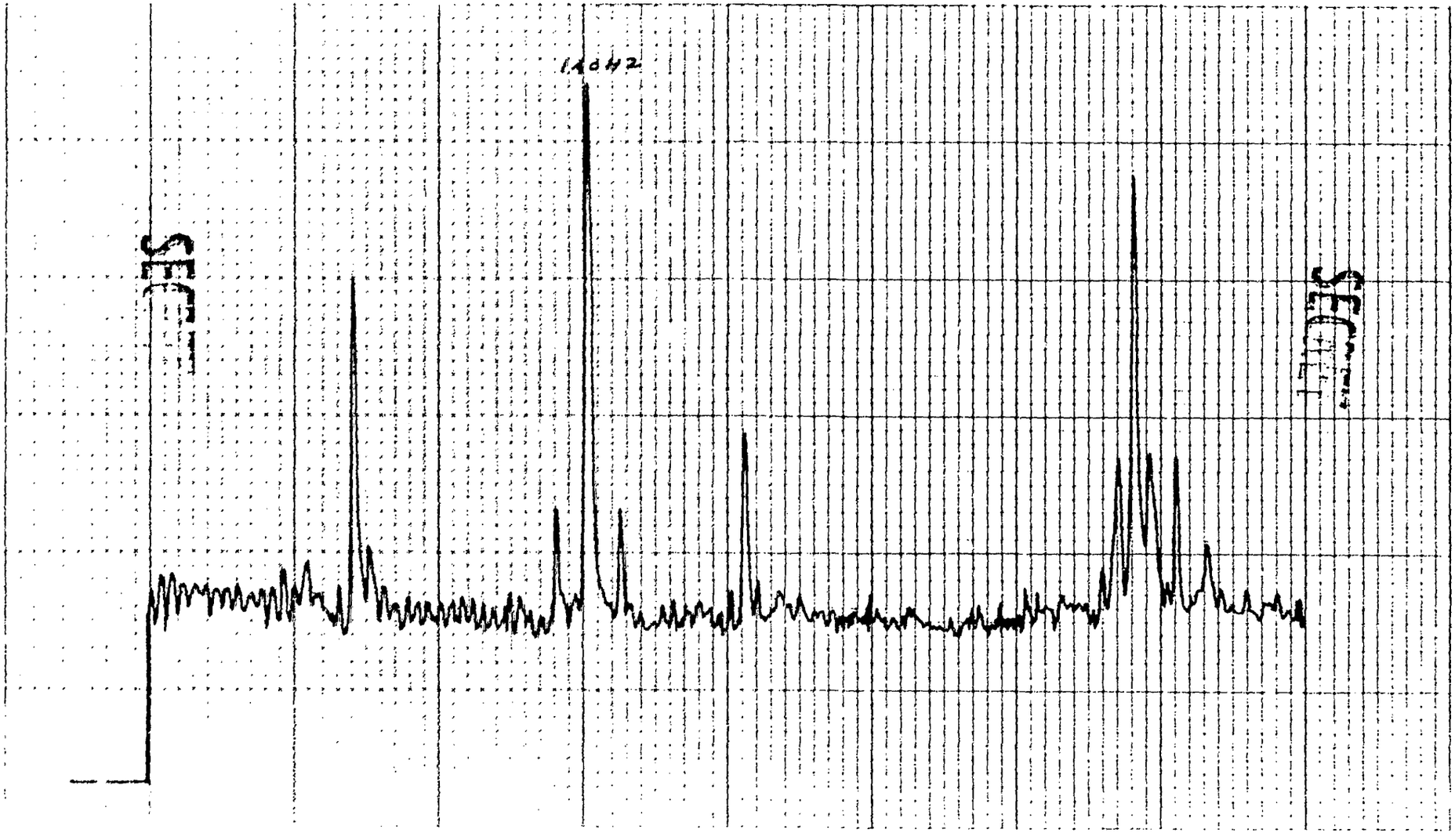
46 0703

CONTROL: 1501 - 32 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 09-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+22 DEG. AZ STEERING

REEL: M4
INDEX 3000

INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



K+E

46 0703

CONTROL: 1501 - 32 (DOB)
BEAMFORMED SPECTRUM(ELEMENTS 30-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

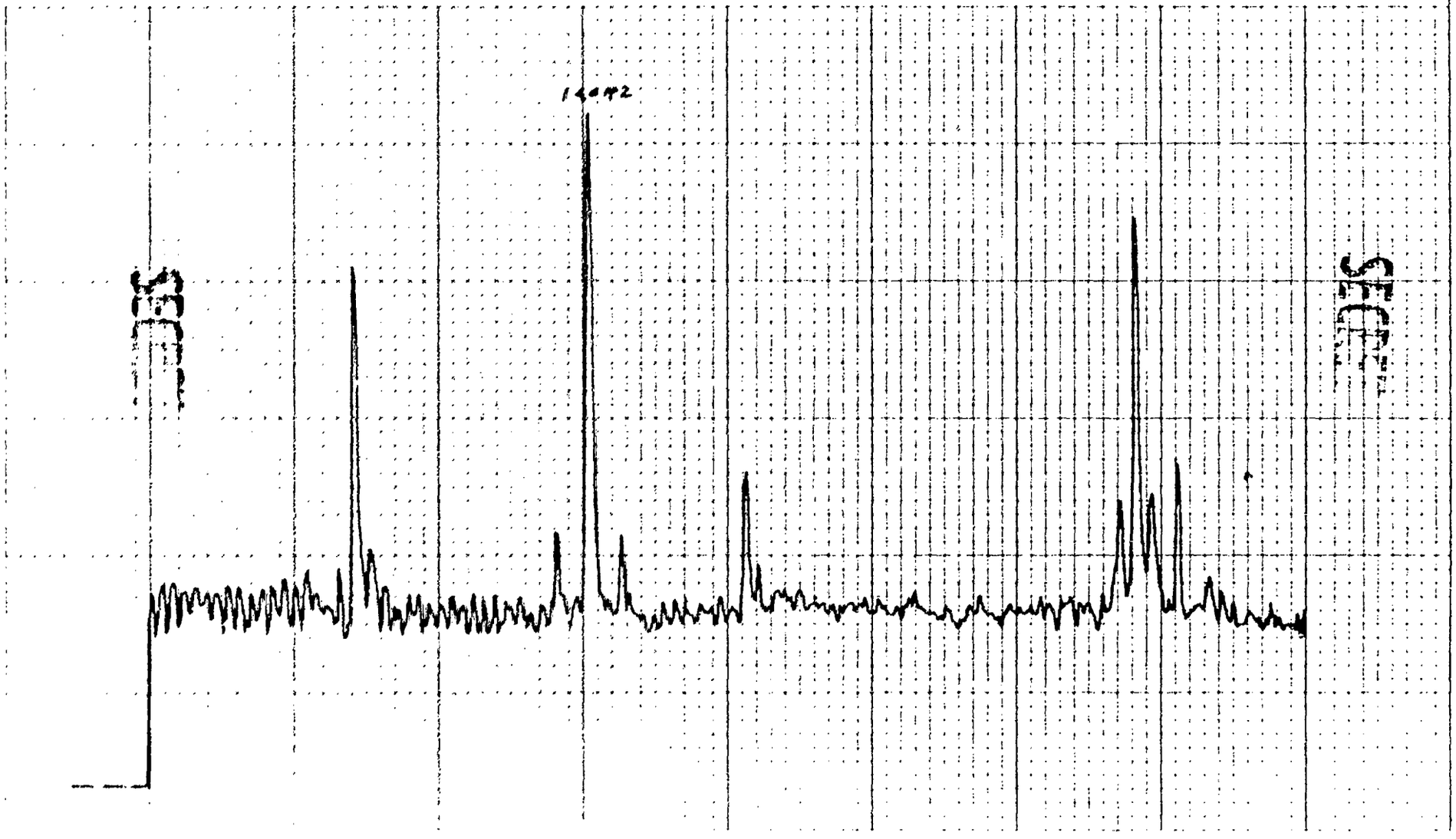
DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+24 DEG. AZ STEERING

REEL: N4

INDEX 3000

INTEGRATION TIME 320 SECS

ATTEN: -30 DB
FILTER WTG: HANNING

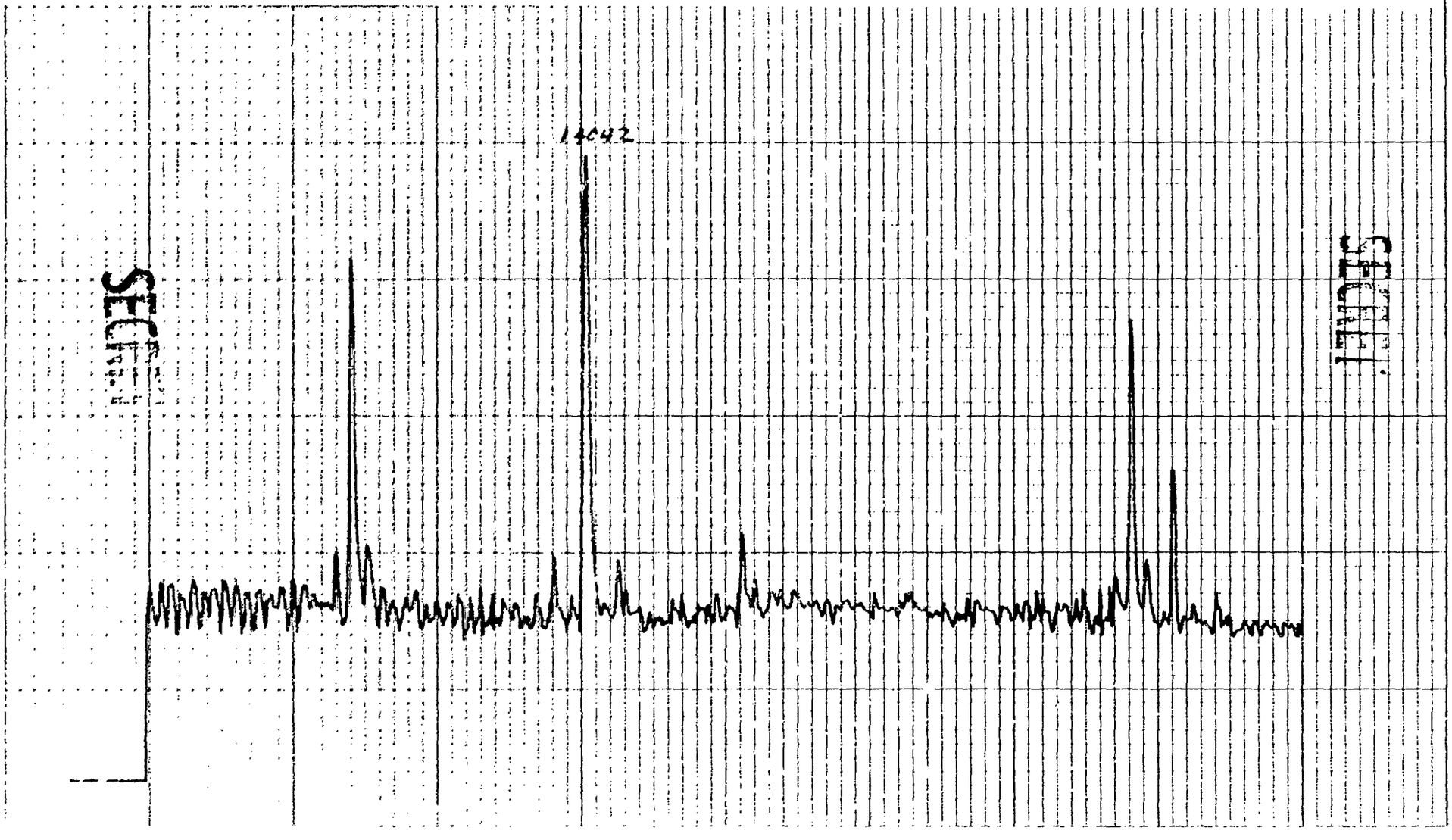


CONTROL: 1501 - 32 (DP8)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+26 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB

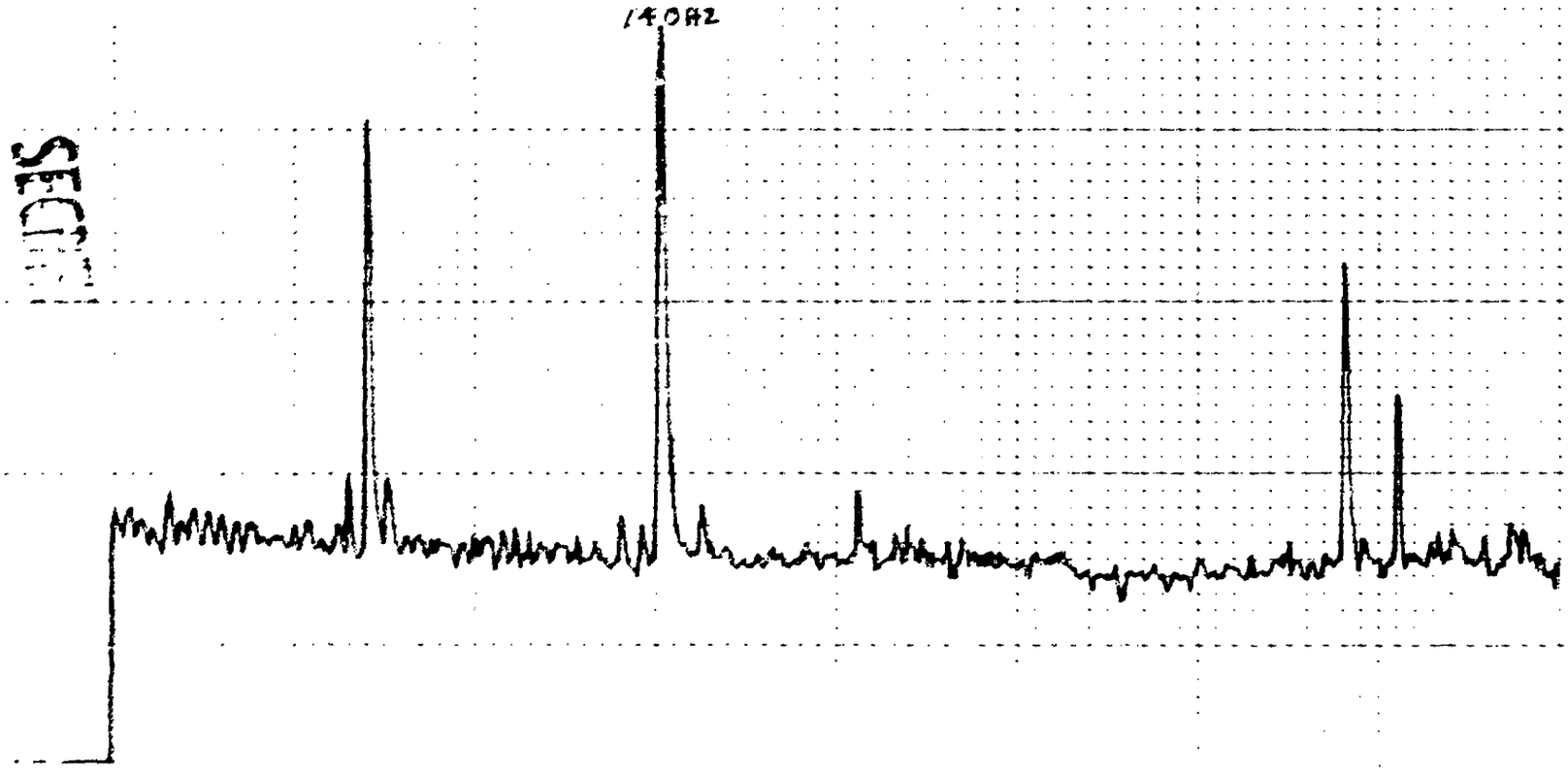


46 0703

CONTROL: 1501 - 32 (288)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAVE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
80-268 09-53
DATE/TIME: 9-15 77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+28 DEG. AZ STEERING

REEL: 44
INDEX 3000
INTEGRATION TIME 320 SECS
ATTEN: -70 DB
FILTER WTG: HANNING

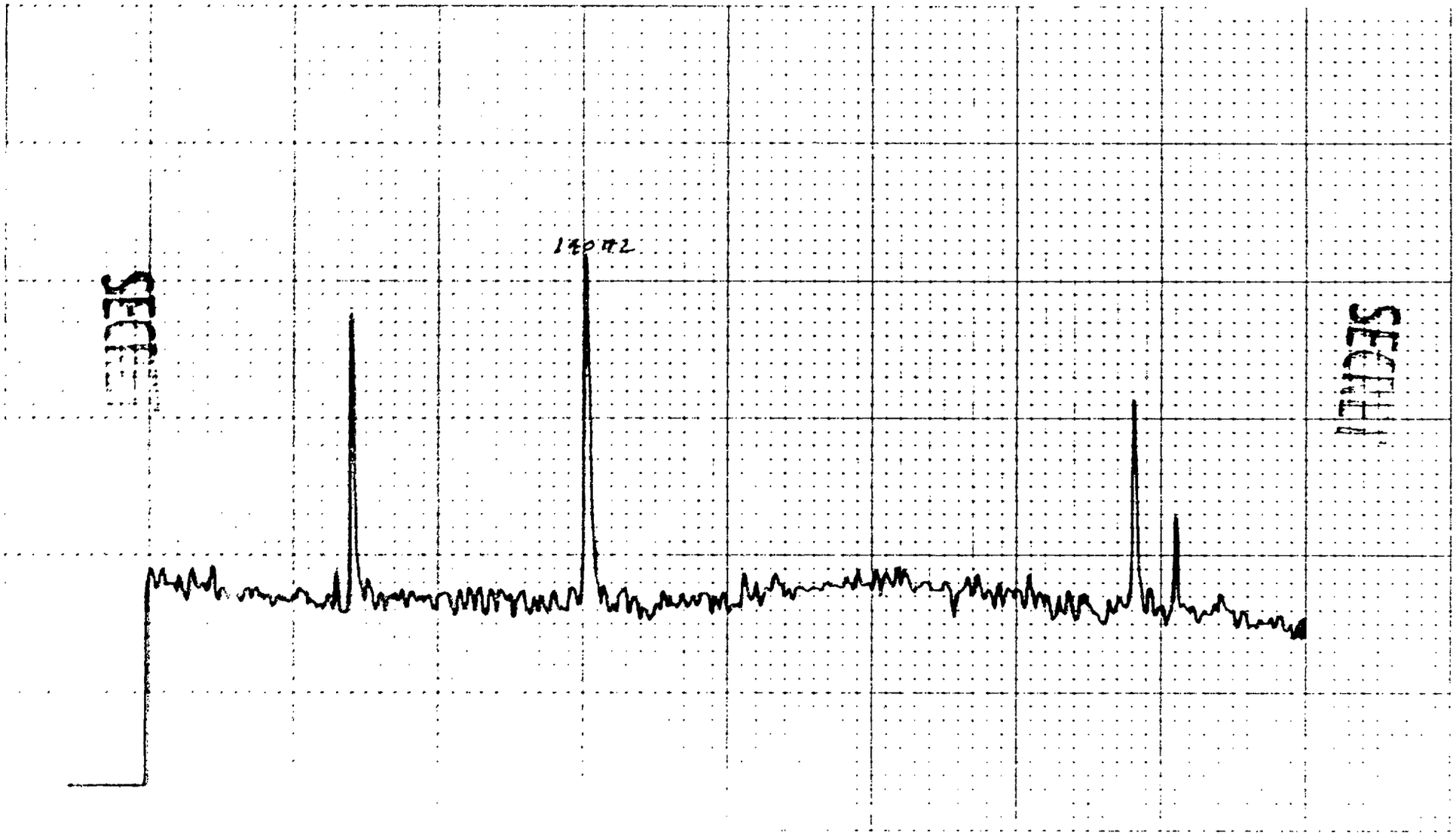


CONTROL: 1501 - 32 (DPR)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+30 DEG. AZ STEERING

REEL: #4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -30 DB
WTG: HANNING



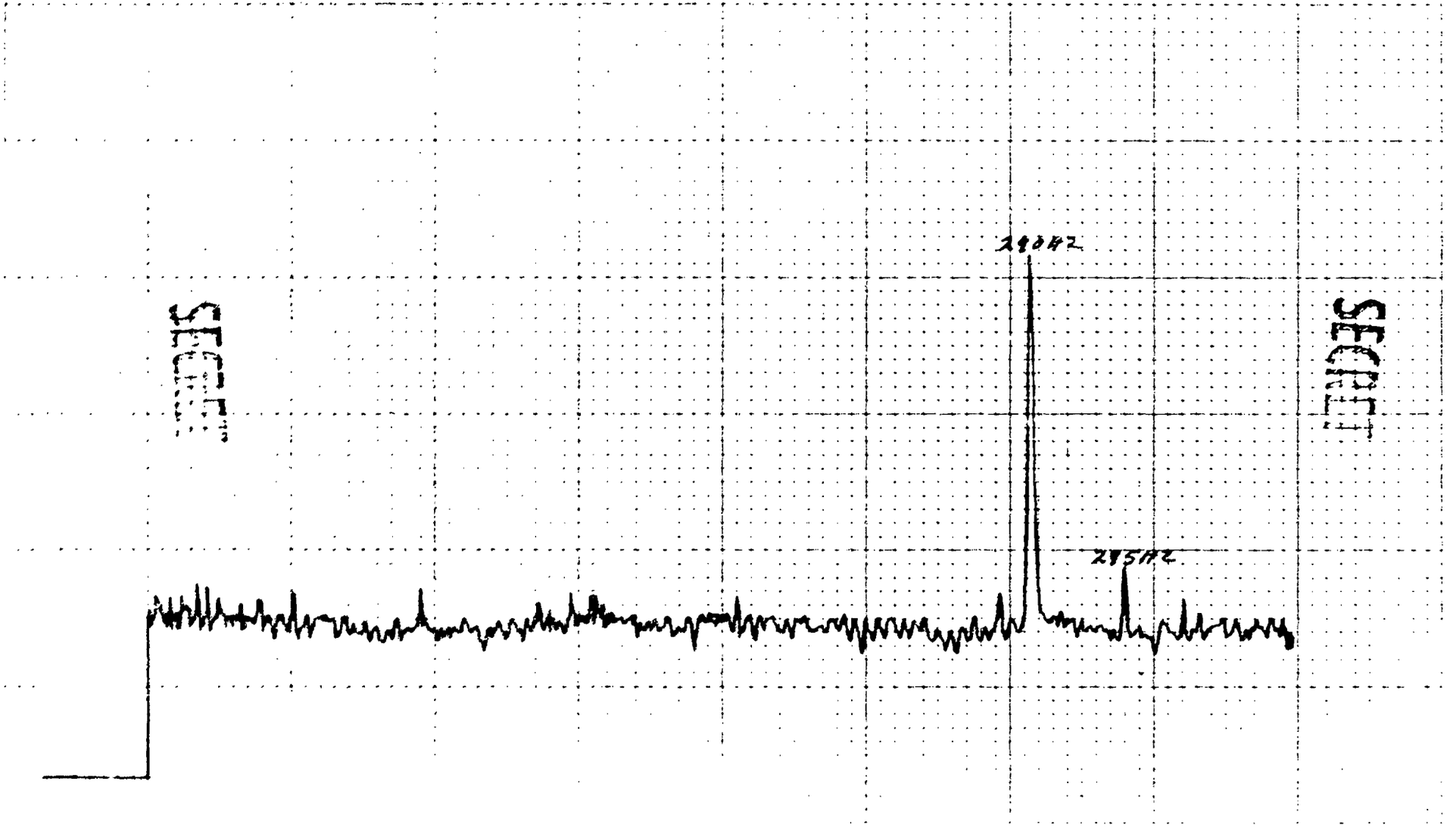
46 0703

CONTROL: 1501 - 32 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 345-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+ 10 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -30 DB
WTG: HANNING



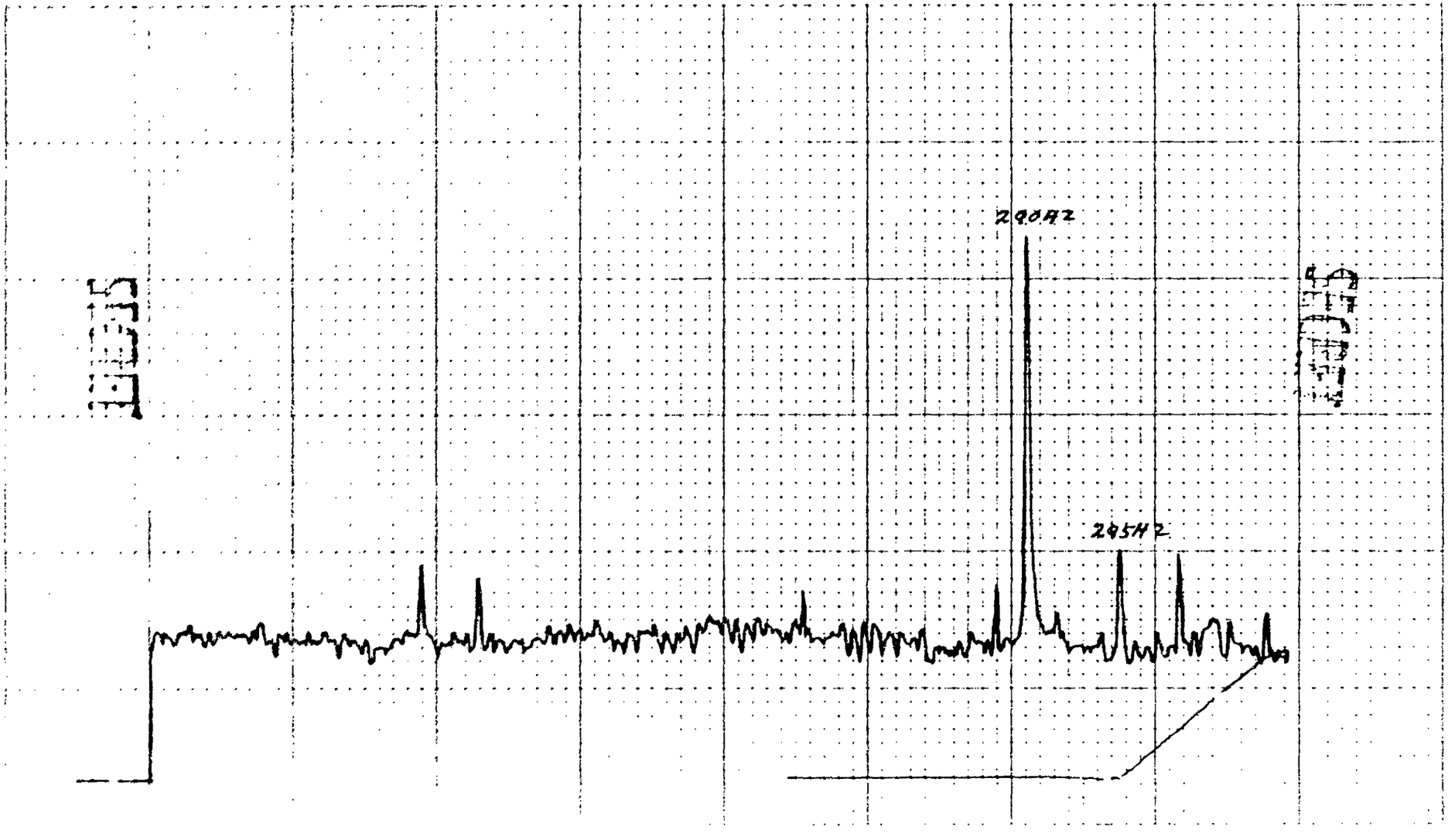
46 0703

CONTROL: 1501 - 32 (288)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+12 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB

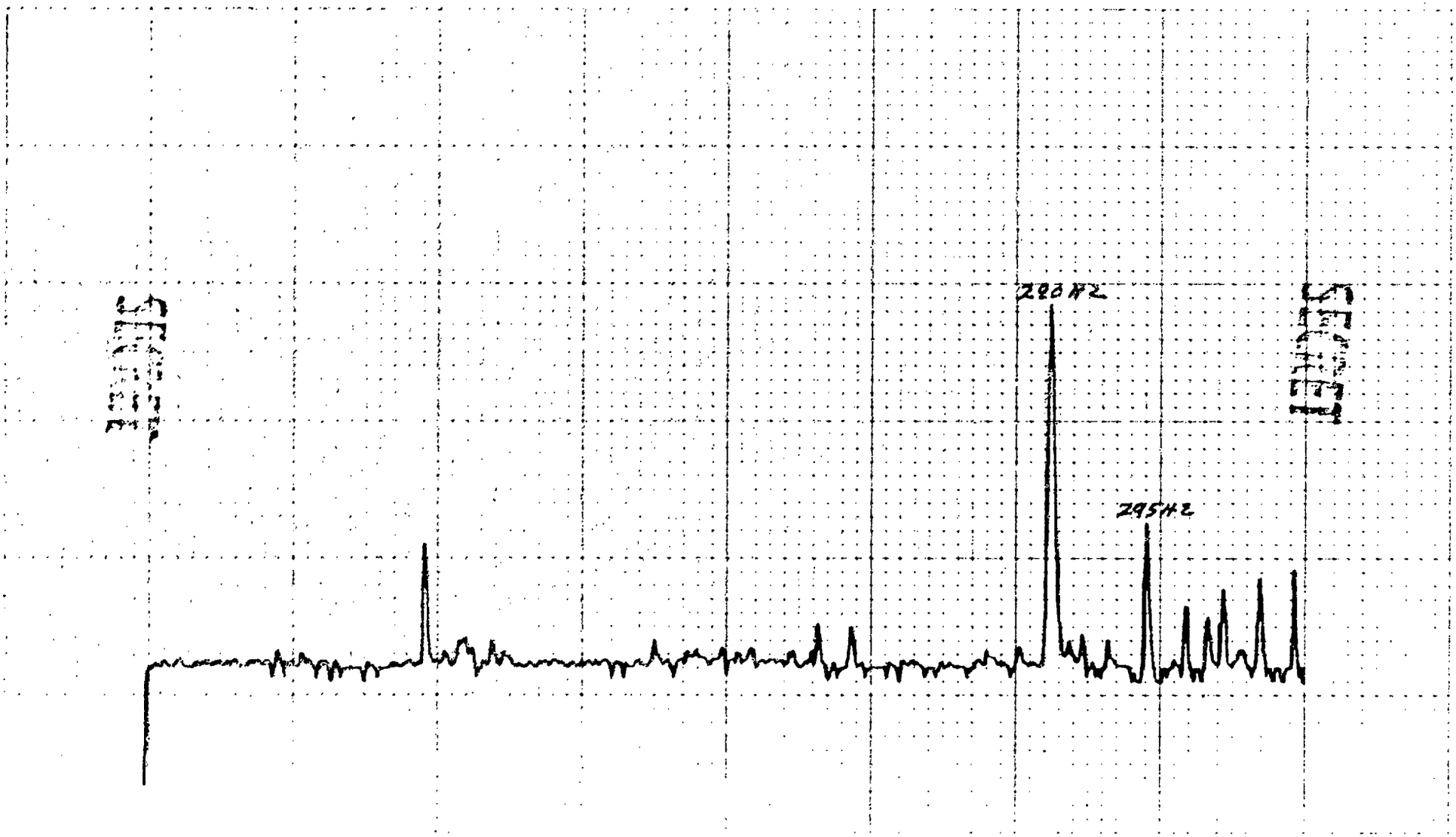


CONTROL: 1501 - 32 (208)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-32)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+14 DEG. AZ STEERING

REEL: M4
INDEX 3000

INTEGRATION TIME 320 SECS
ATTEN: -70 DB
FILTER WTG: HANNING



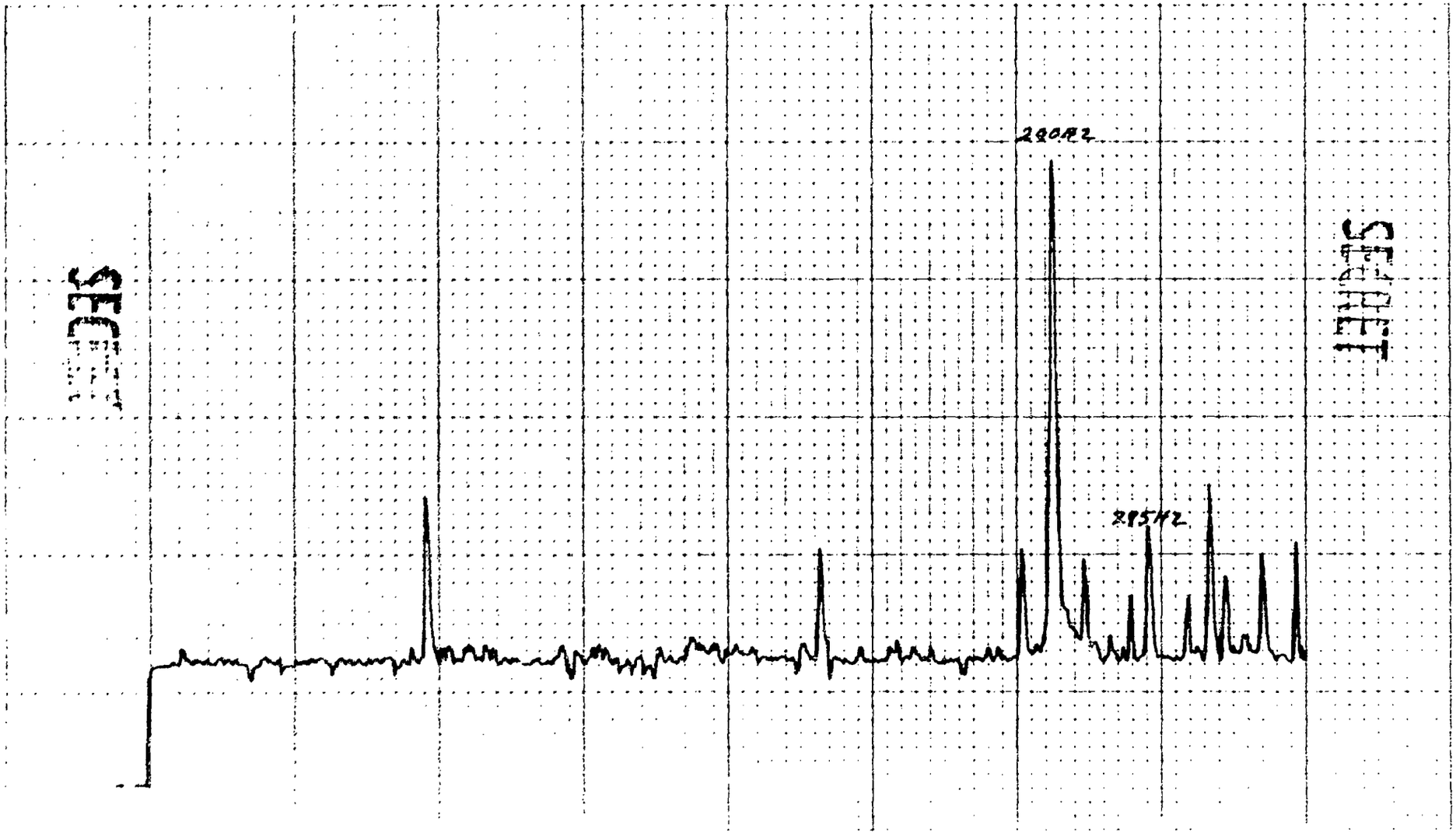
46 0703

CONTROL: 1501 - 32 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+16 DEG. AZ STEERING

REEL: N4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 300c
ATTEN: -30 DB

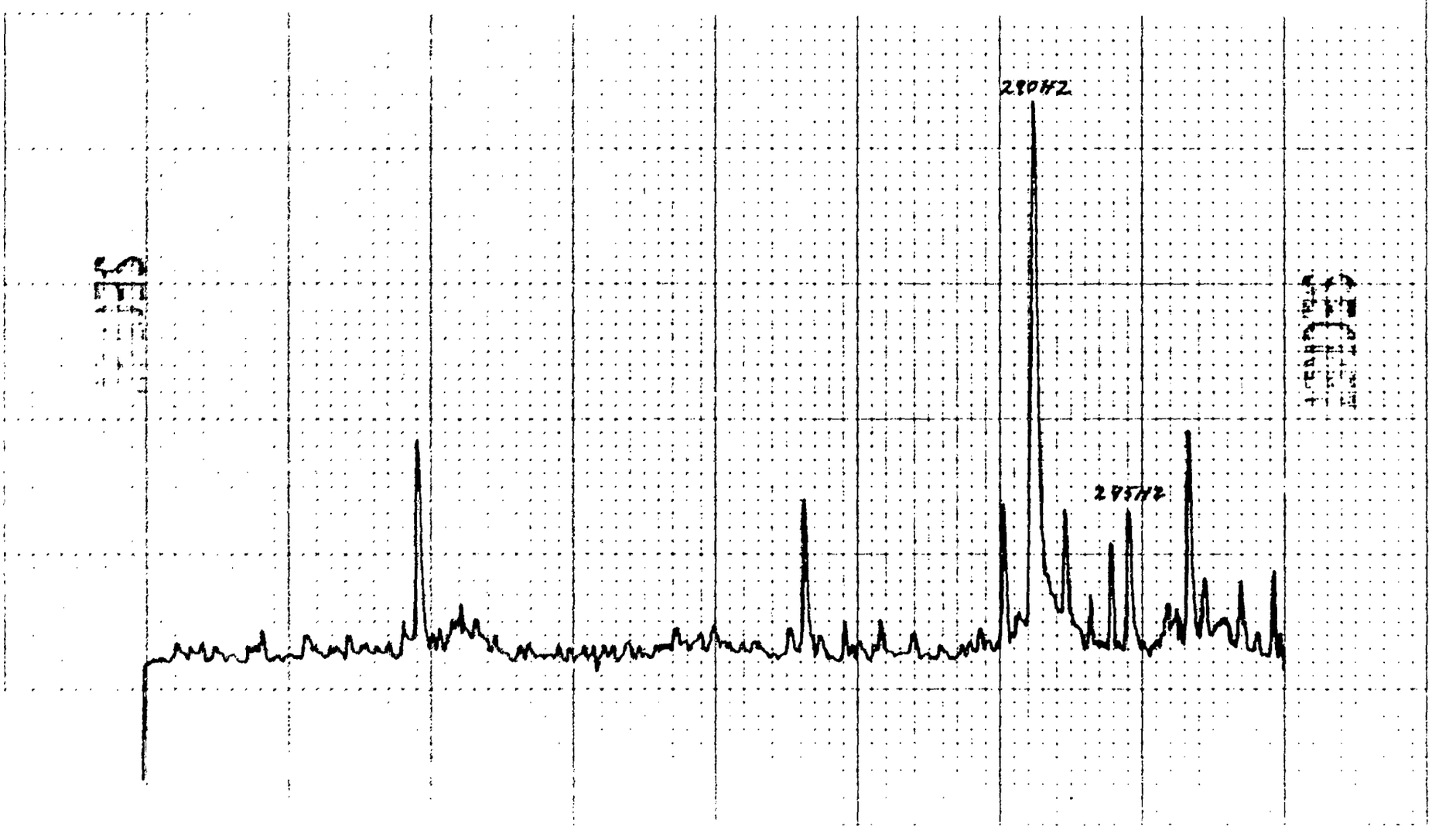


CONTROL: 1501 - 32 (D18)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1901Z
ANALYSIS BANDWIDTH: 1/10HZ
+18 DEG. AZ STEERING

REEL: M4
INDEX 3000

INTEGRATION TIME 320 SECS
ATTEN: -70 DB
FILTER WTG: HANNING

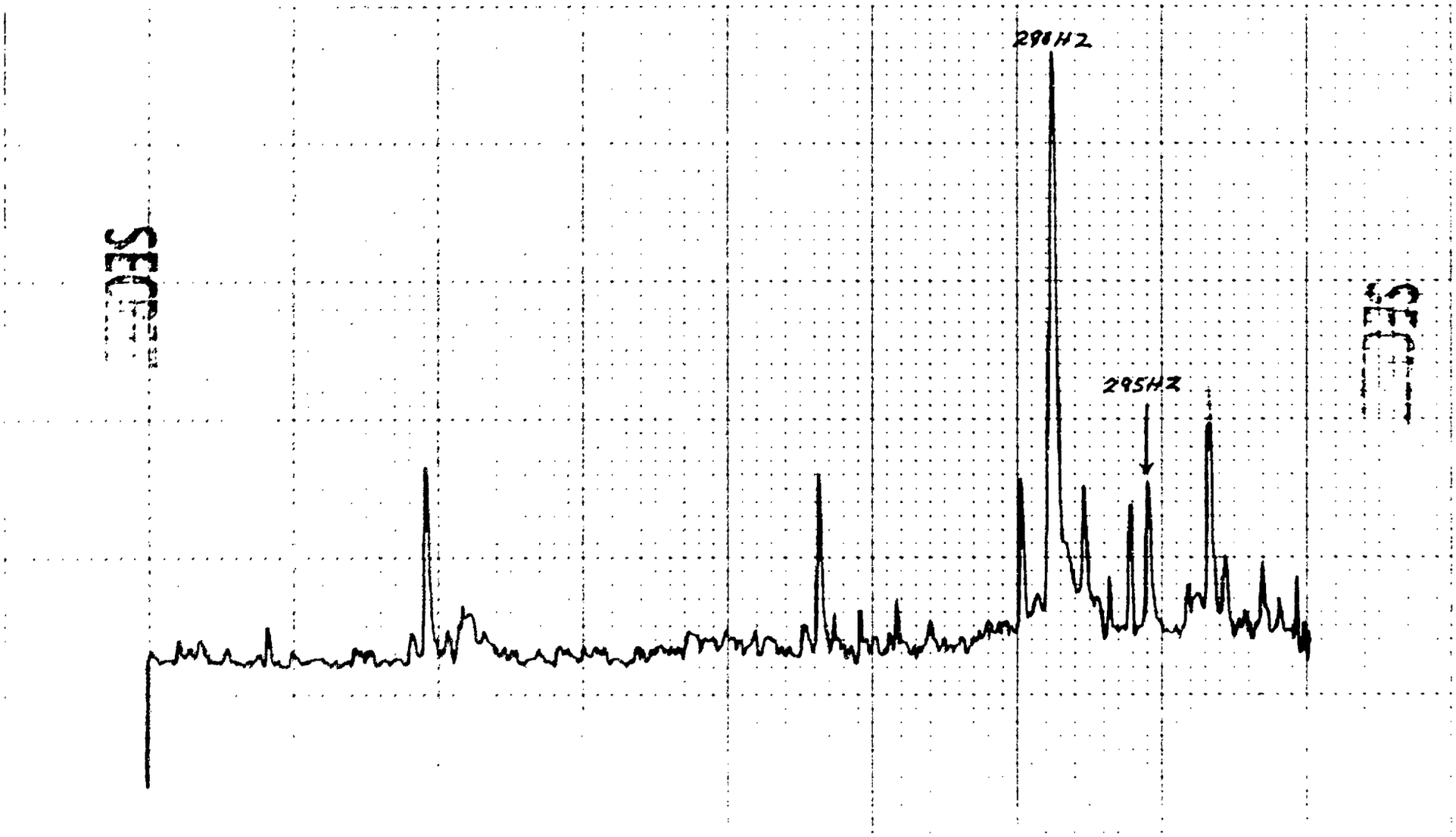


CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS:
20-26 & 20-53)
DATE/TIME: 3-16-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+20 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: 30 DB



46 0703

CONTROL: 1501 - 32 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

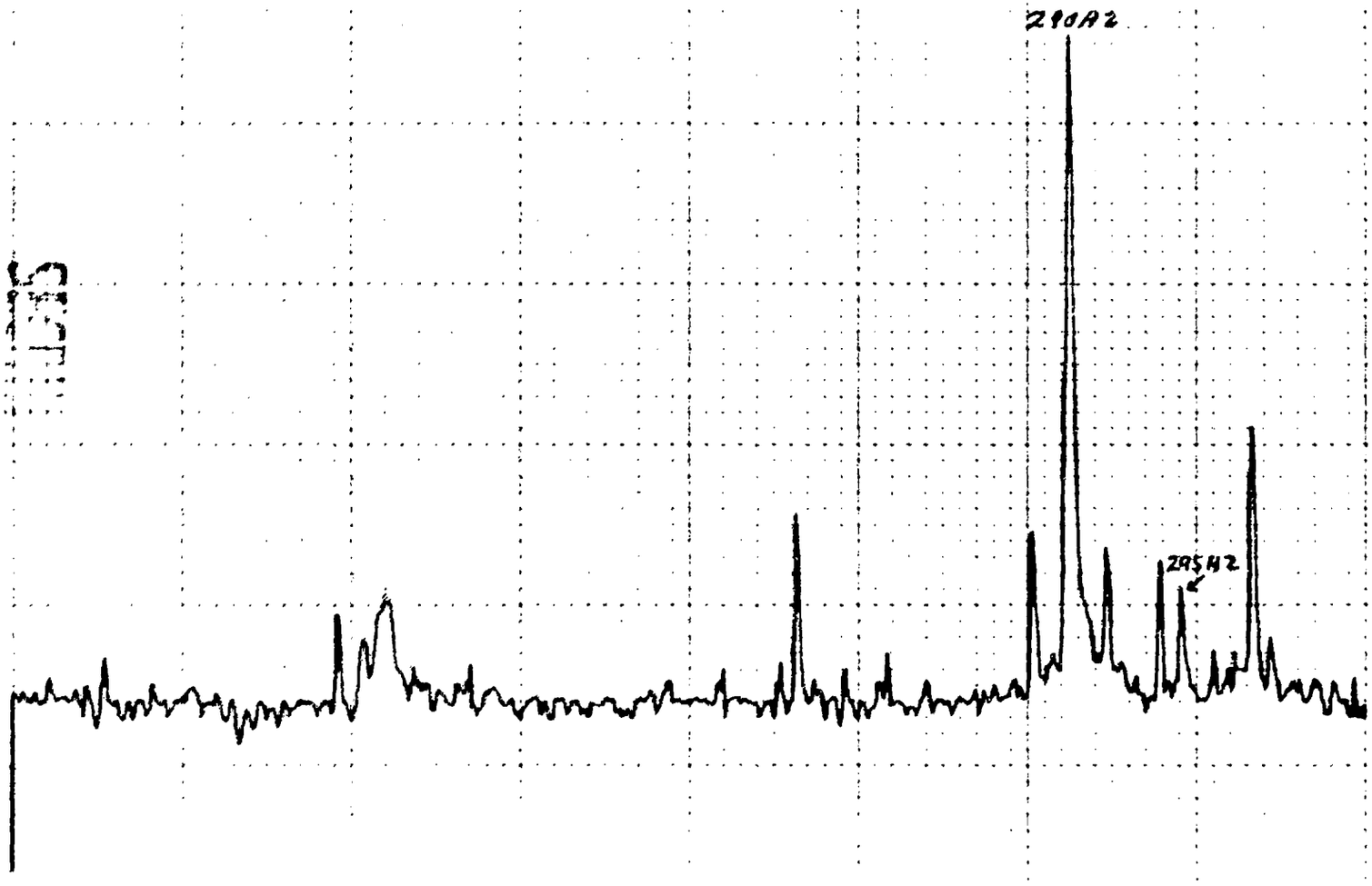
DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+22- DEG. AZ STEERING

REEL: M4

INDEX 3000

INTEGRATION TIME 320 SECS
FILTER

ATTEN: -30 DB
WTG: HANNING



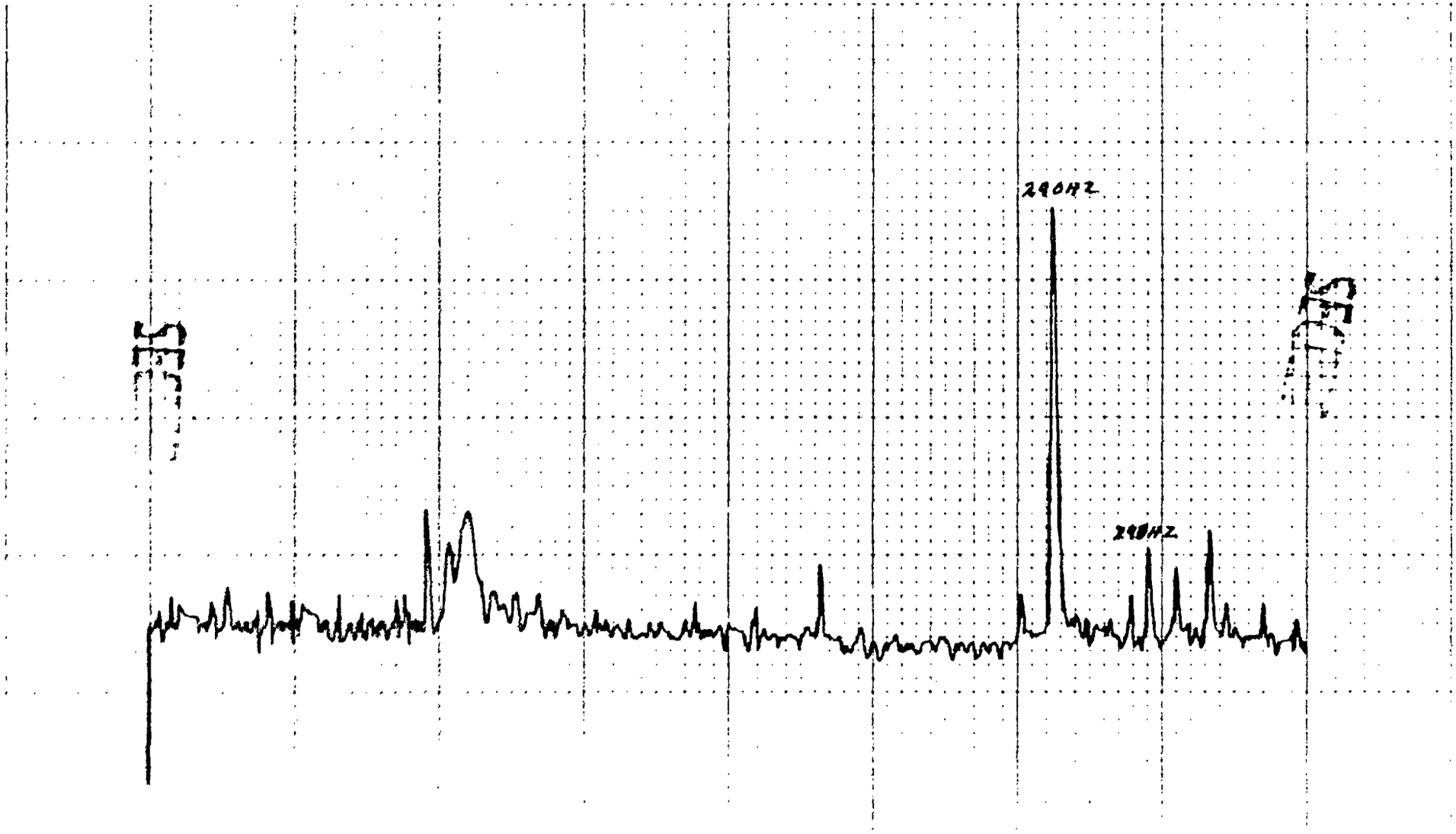
46 0703

CONTROL: 1501 - 32 (DPB)
BEAMFORMED SPECTRUM (ELEMENTS 20-26 & 09-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS:
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+ 24 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB



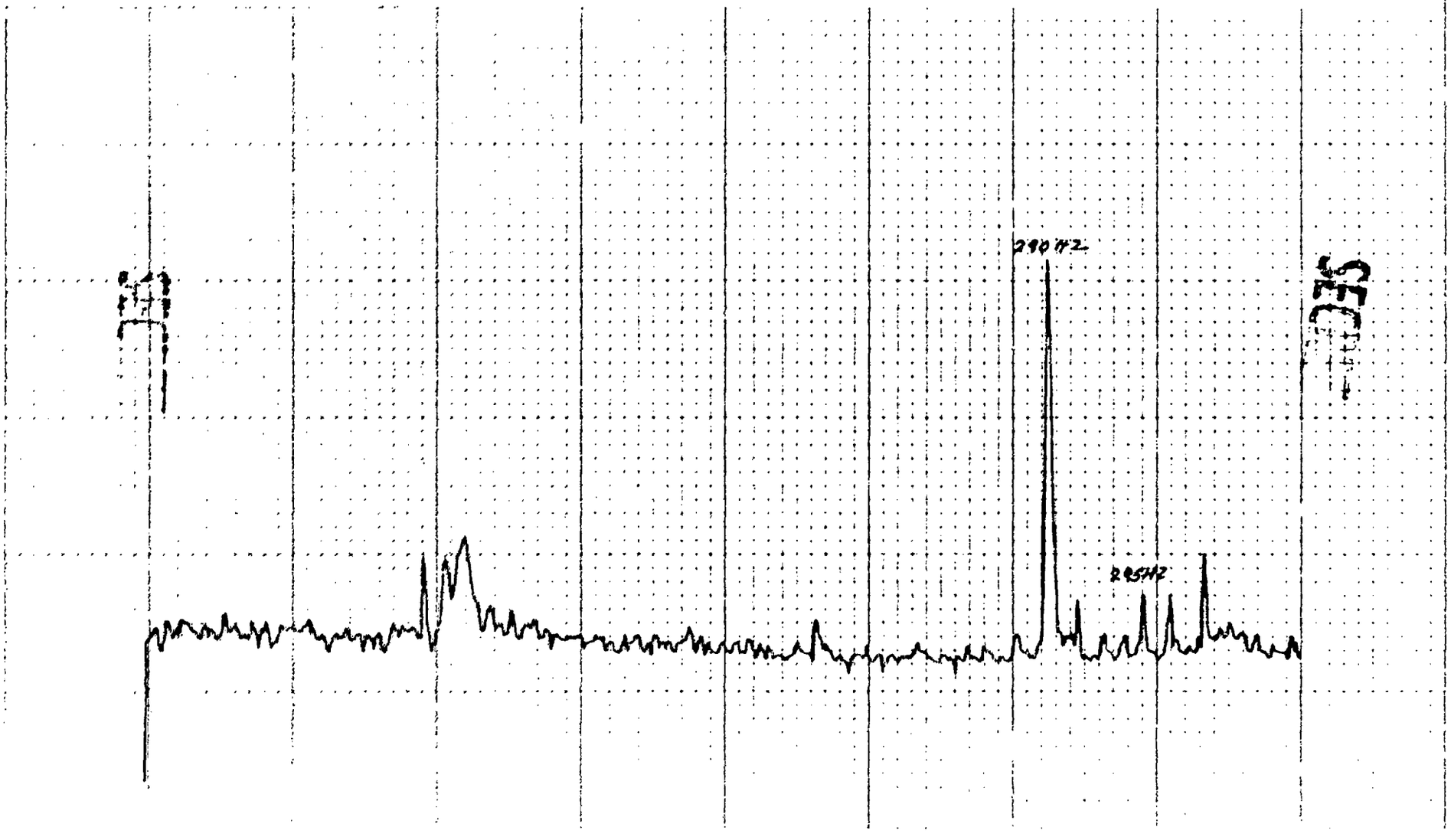
46 0703

CONTROL: 1501 - 72 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
72 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 345-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+26 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

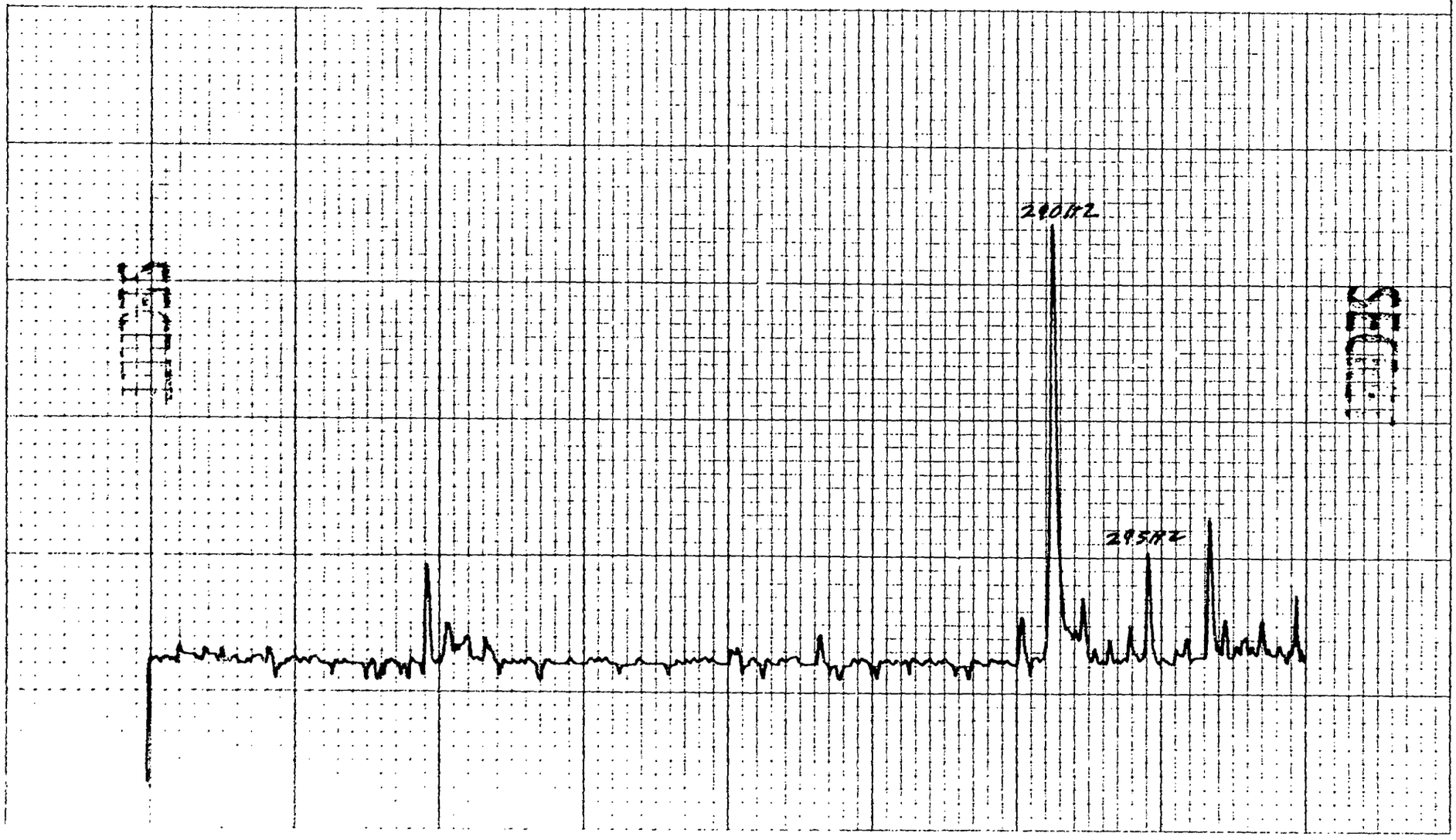
46 0703

CONTROL: 1501 - 32 (DP8)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-79 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+28 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB



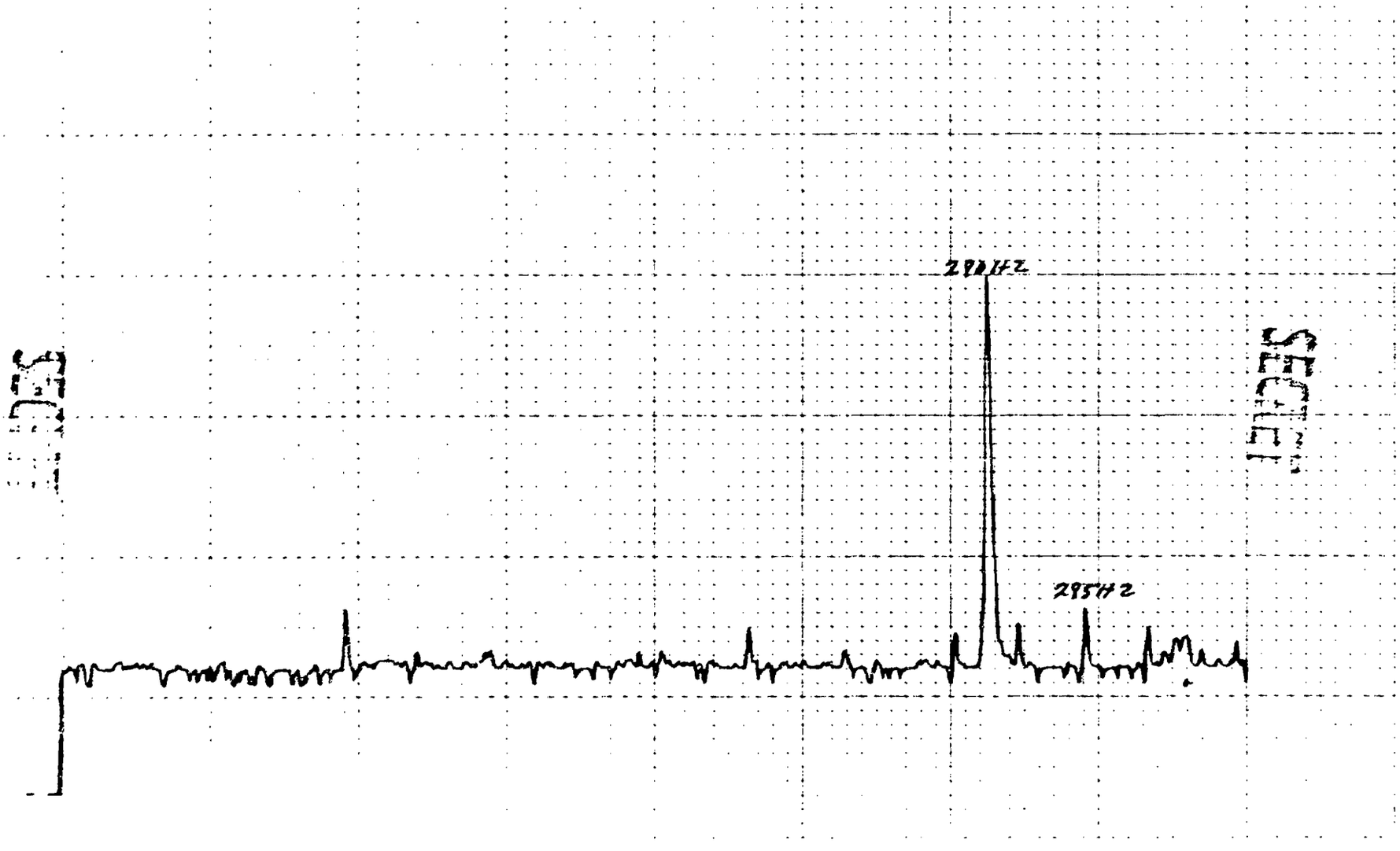
46 0703

CONTROL: 1501 - 32 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 20-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+30 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: 30 DB
WTG: HANNING



SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 8 FREQUENCY 140 HZ NUMBER OF ELEMENTS 48

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-27	
MCPS-32 CAL. CORRECTION	+10	-17	
BEAMFORMER GAIN	+30	+13	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .2	+13.2	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-71.6	
MCPS-32 CAL. CORRECTION	+10	-61.6	
BEAMFORMER GAIN	+30	-31.6	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+13	
SIGNAL LEVEL FOR SNR	-31.6	44.6	
PROCESSOR CORRECTION	-4.0	40.6	
MRA CORRECTION	+ .2	40.8	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	32.6	SNR 1 HZ BAND

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 8 FREQUENCY 290 HZ NUMBER OF ELEMENTS 48

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-24.0	
MCPS-32 CAL. CORRECTION	+10	-14.0	
BEAMFORMER GAIN	+30	+16.0	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	+16.8	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-73.4	
MCPS-32 CAL CORRECTION	+10	-63.4	
BEAMFORMER GAIN	+30	-33.4	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+16.0	
SIGNAL LEVEL FOR SNR	-33.4	49.4	
PROCESSOR CORRECTION	-4.0	45.4	
MRA CORRECTION	+ .8	46.2	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	38.0	SNR 1 HZ BAND

CONFIDENTIAL

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 8 FREQUENCY 295 HZ NUMBER OF ELEMENTS 48

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-60.0	
MCPS-32 CAL. CORRECTION	+10	-50.0	
BEAMFORMER GAIN	+30	-20.0	SIG. LEVEL FOR SNR CALCULATION
MRA CORRECTION	+ .8	-19.2	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-73.1	
MCPS-32 CAL. CORRECTION	+10	-63.1	
BEAMFORMER GAIN	+30	-33.1	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-20.0	
SIGNAL LEVEL FOR SNR	-33.1	13.1	
PROCESSOR CORRECTION	-4.2	8.9	
MRA CORRECTION	+ .8	9.7	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	1.5	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 8

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-19.4	-15.2	
MRA SIGNAL LEVEL	+13.2	+16.8	-19.2
ARRAY SIGNAL GAIN	32.6	32.0	
20 LOG 48 (# of elements)	33.6	33.6	
DIFFERENCE	-1.0	-1.6	

ARRAY GAIN

MRA SNR	40.8	46.2	9.7
MEAN OMNI SNR	29.4	35.4	
ARRAY GAIN	11.4	10.8	
THEORETICAL AZIMUTH GAIN (at MRA)	15.3	16.9	17.0
DIFFERENCE	-3.9	-6.1	

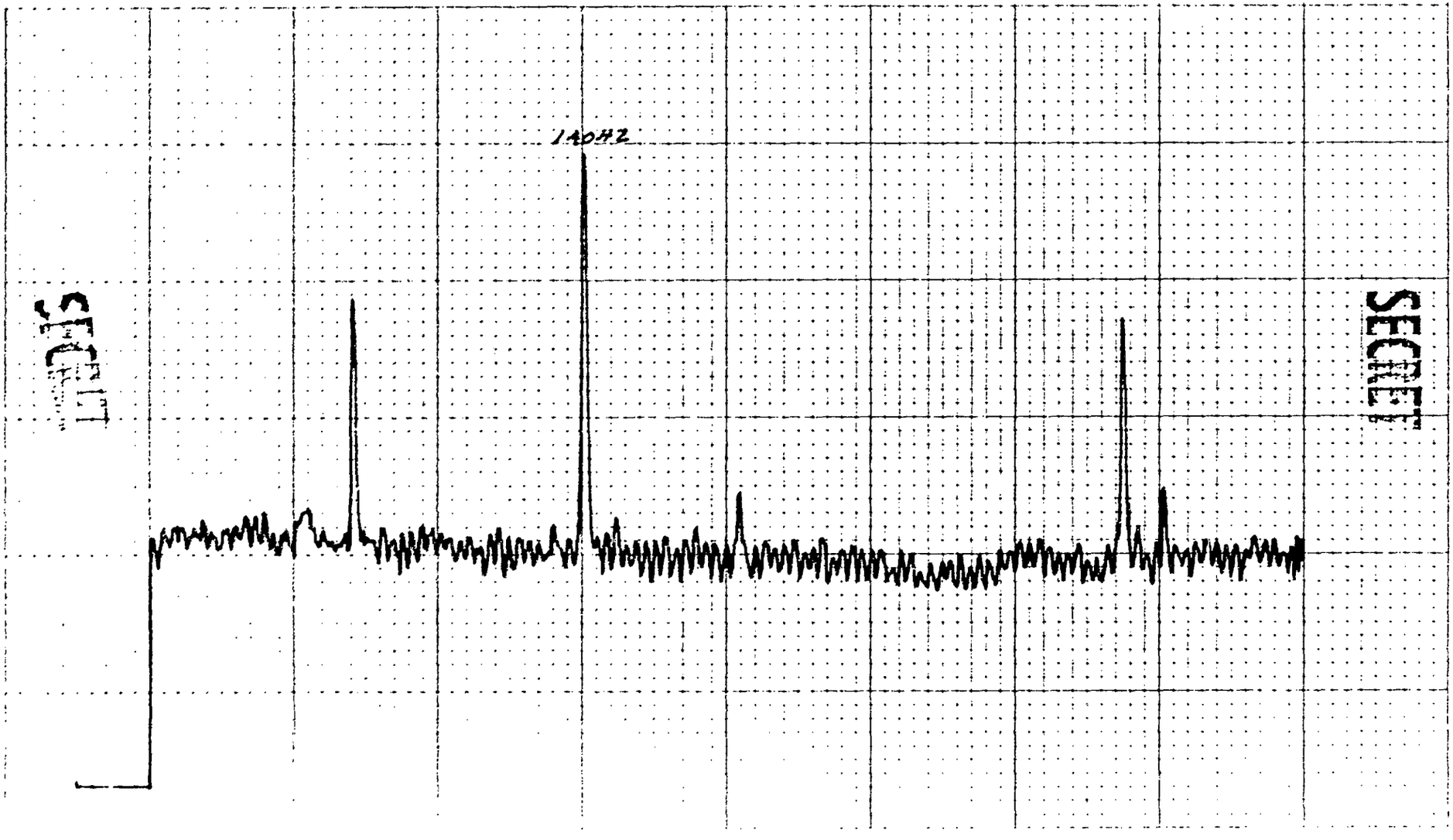
46 0703

CONTROL: 1501 - 48 (DBB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+14 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -70 DB
WTG: HANNING



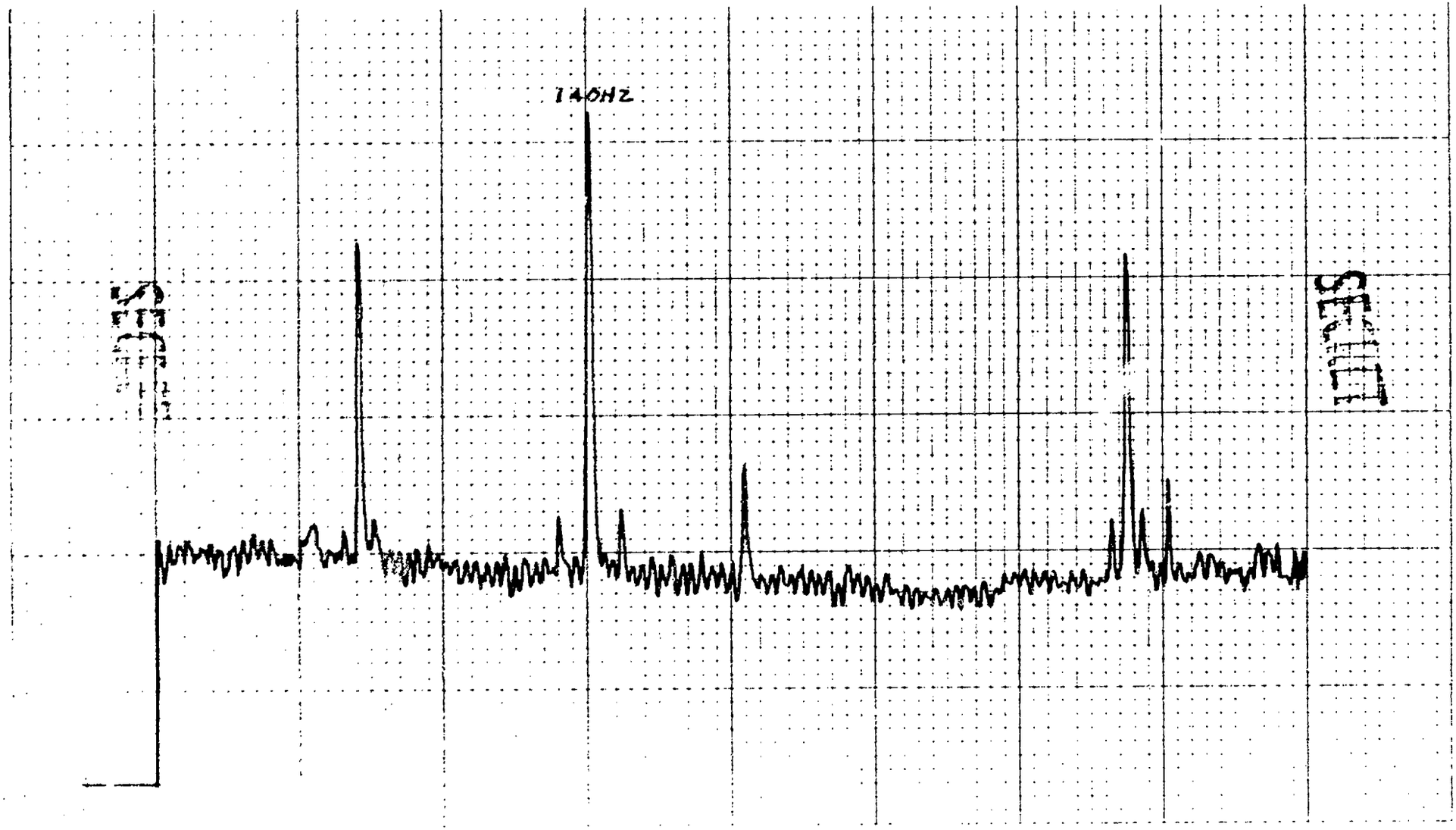
46 0703

CONTROL: 1501 -48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 -1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+16 DEG. AZ STEERING

REEL: 44
INDEX 3000

INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING

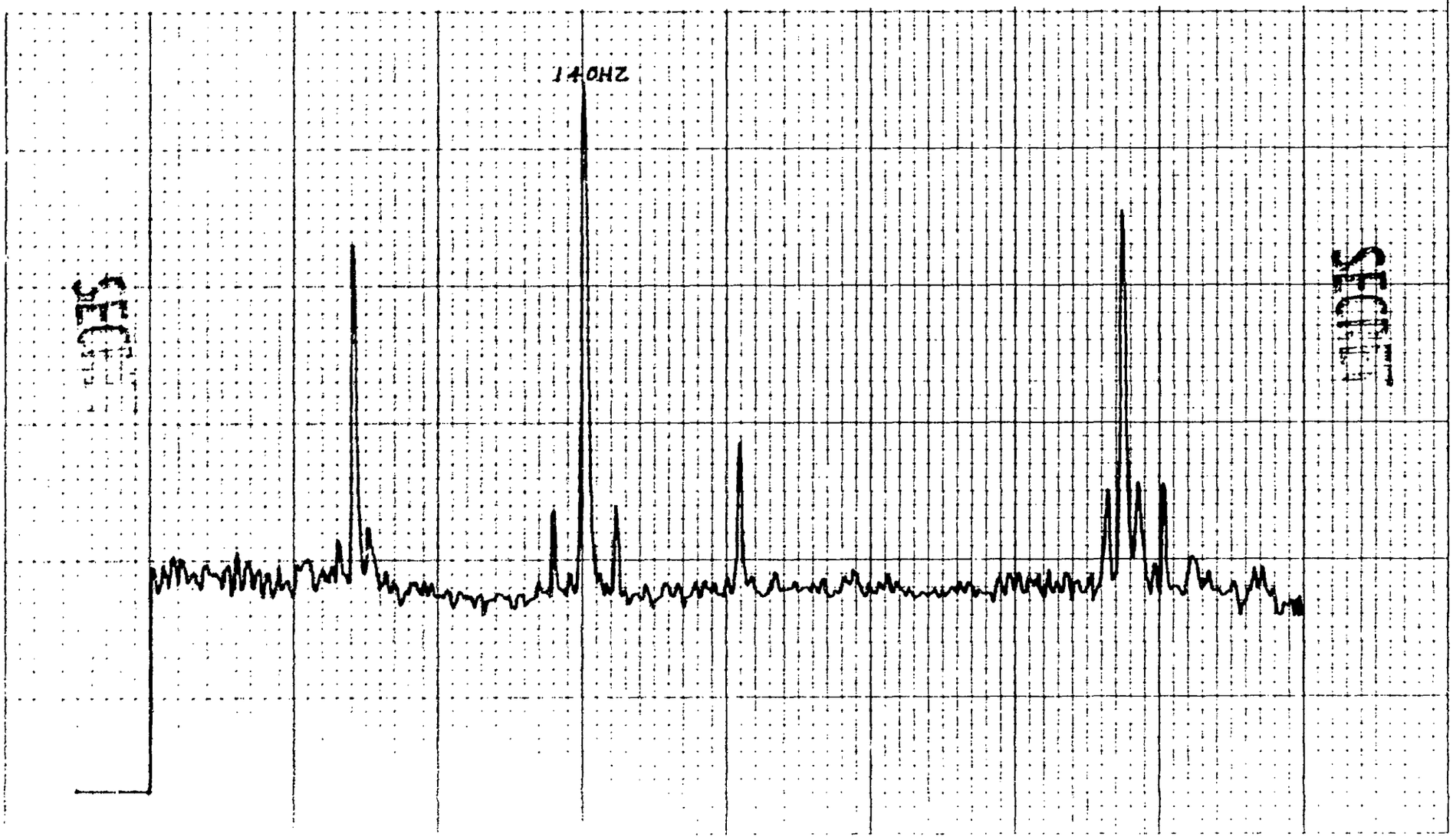


46 0703

CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+18 DEG. AZ STEERING

REEL: 44
INDEX 3000
INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



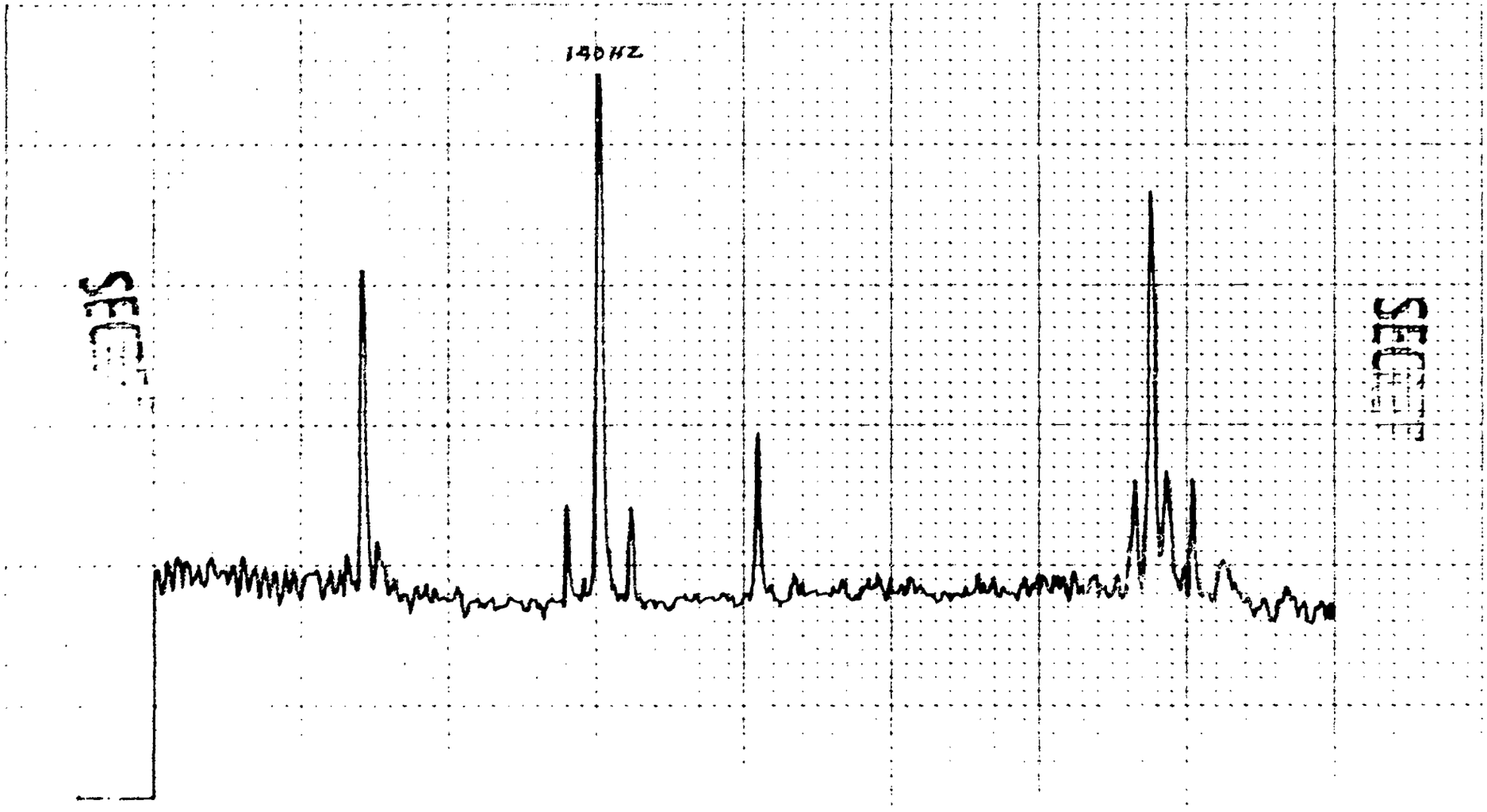
46 0703

CONTROL: 1501 - 48 (DP8)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
48 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+19 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: 30 DB

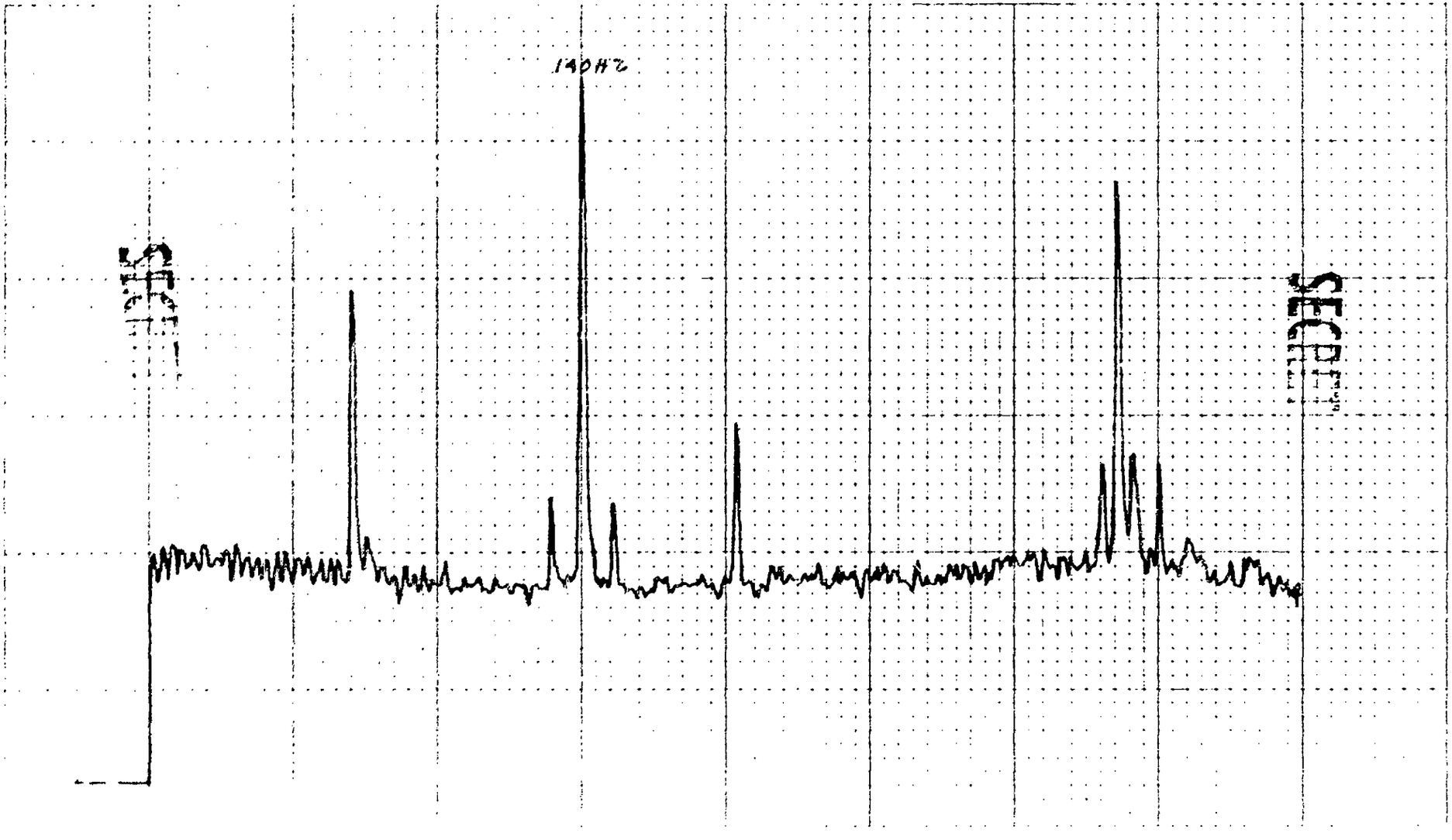


CONTROL: 1501 - 48 (DOE)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+30 DEG. AZ STEERING

REEL: #4
INTEGRATION TIME 320 SECS
1 FILTER

INDEX 3000
ATTEN: -30 DB
WTG: HANNING



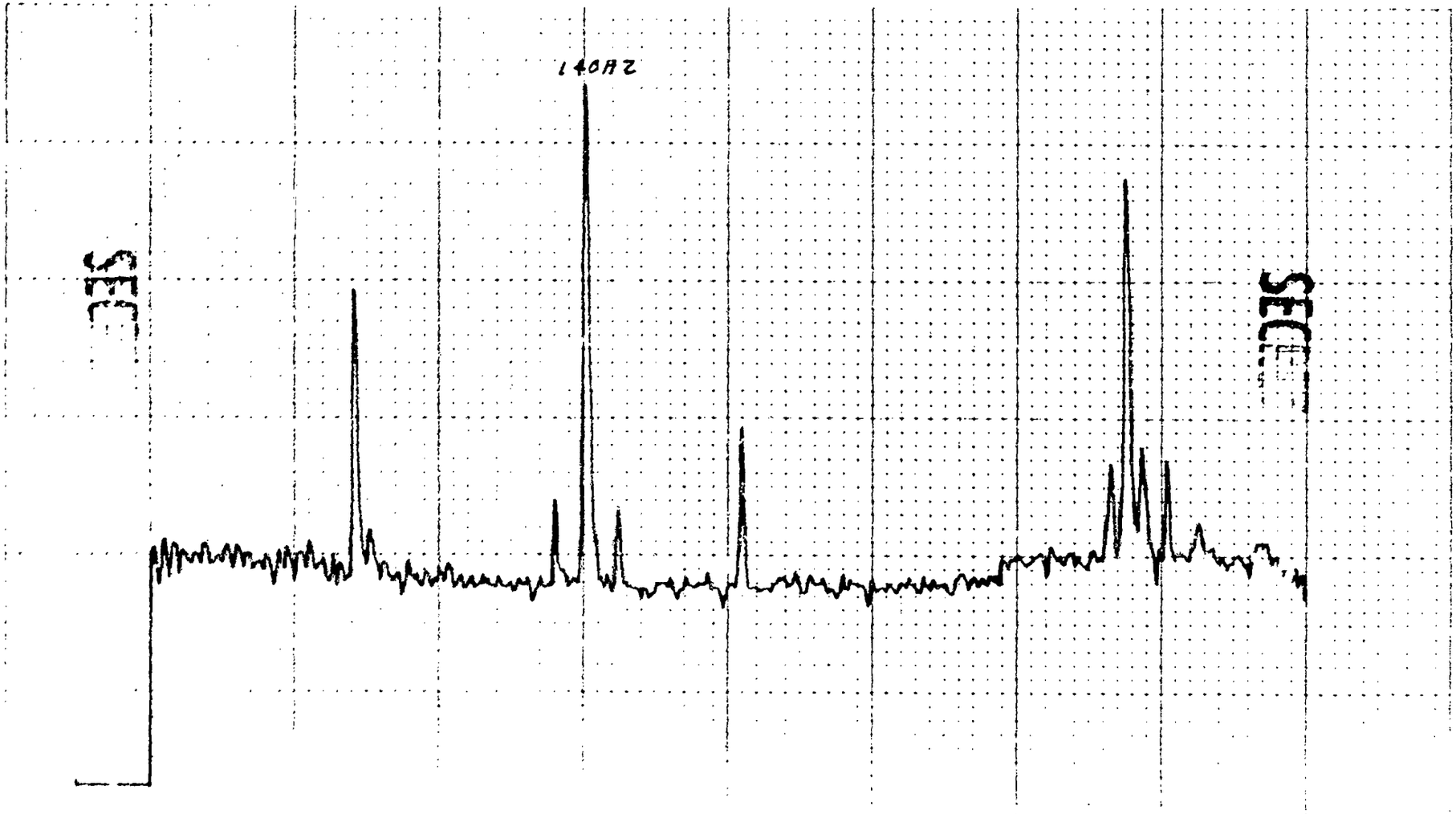
46 0703

CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+21 DEG. AZ STEERING

REEL: M4
INDEX 3000

INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



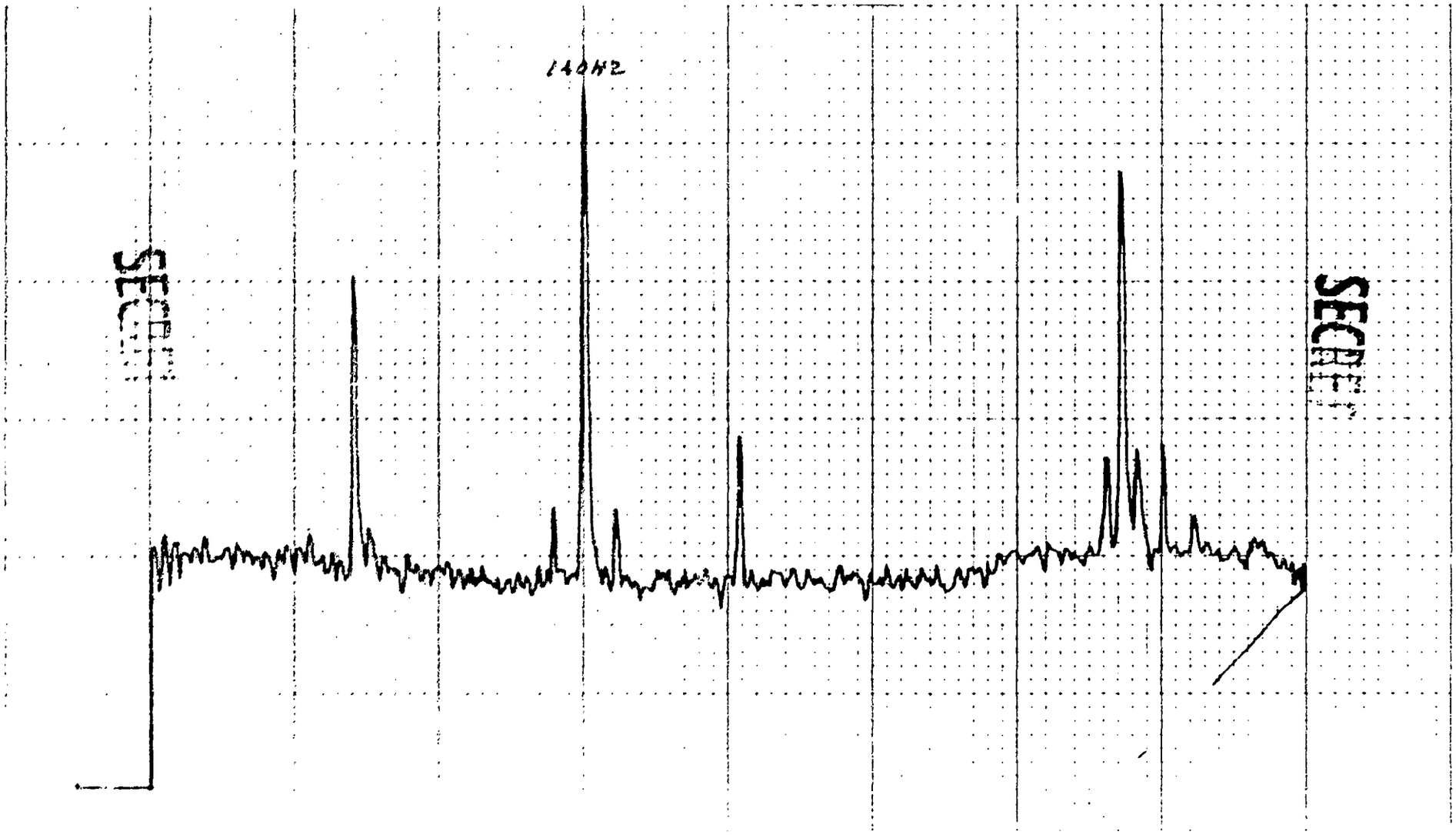
46 0703

CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 8-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+22 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB

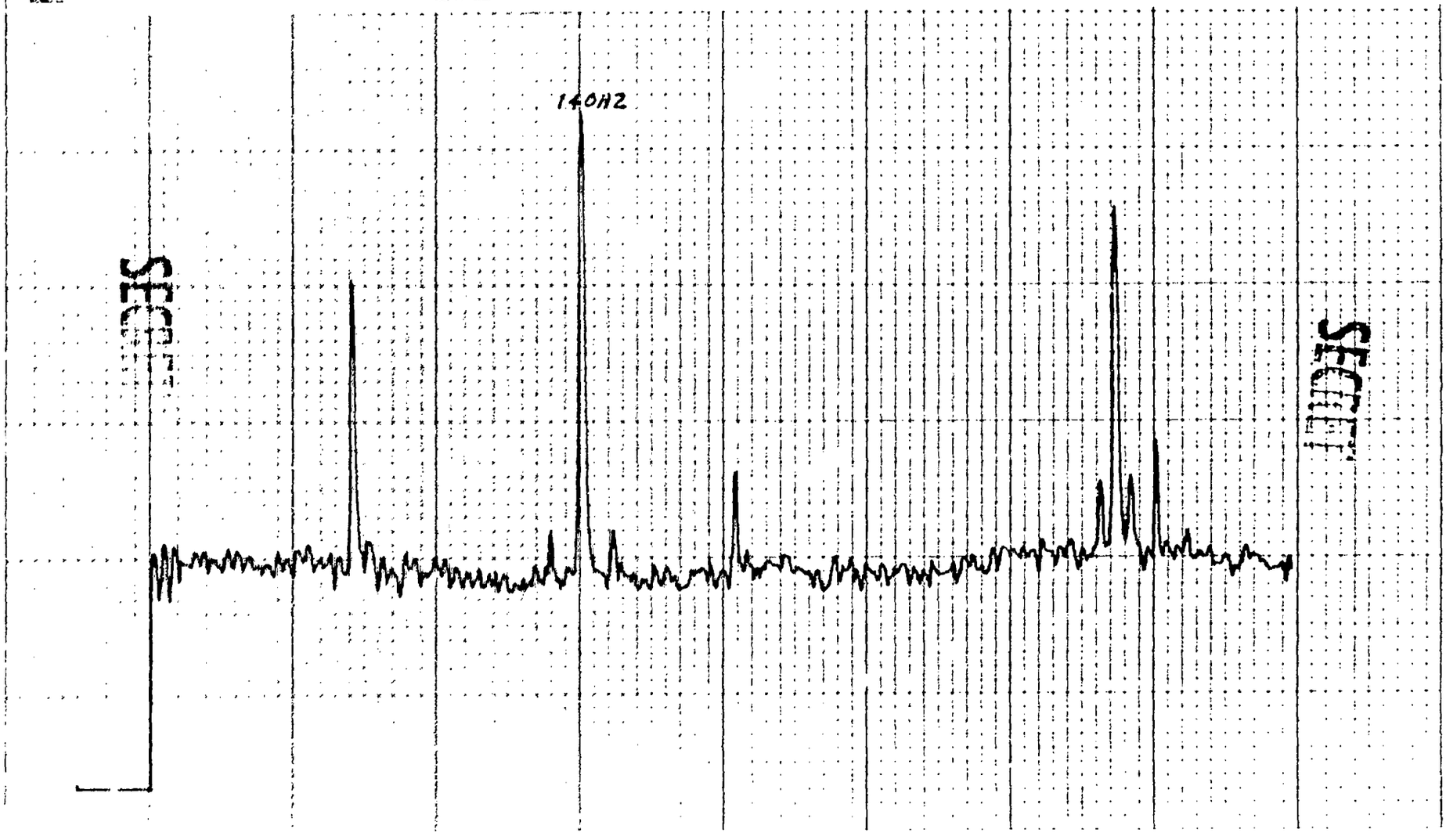


CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+24 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB



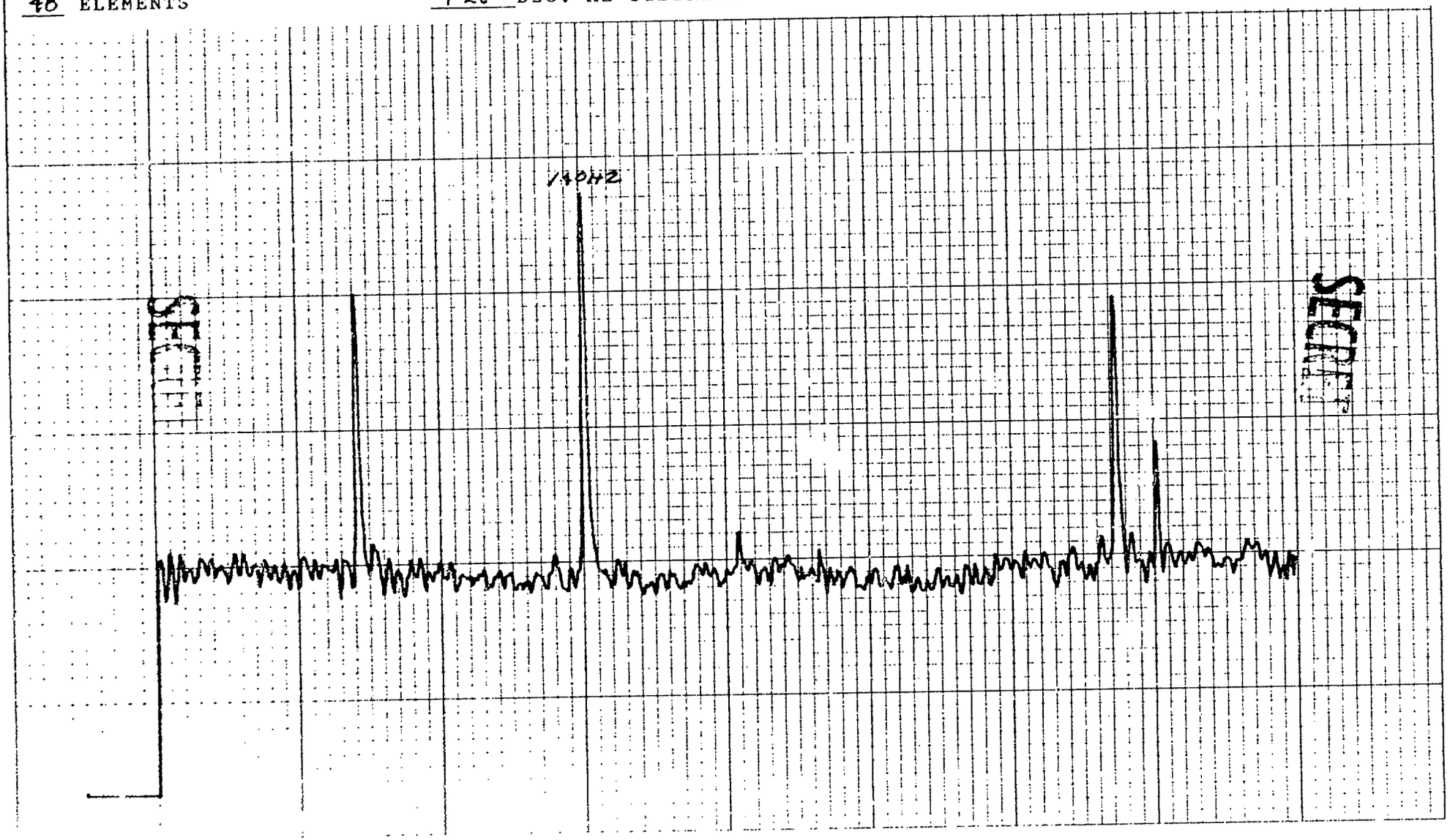
46 0703

CONTROL: 1501 - 48 (DPE)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
48 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+26 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB



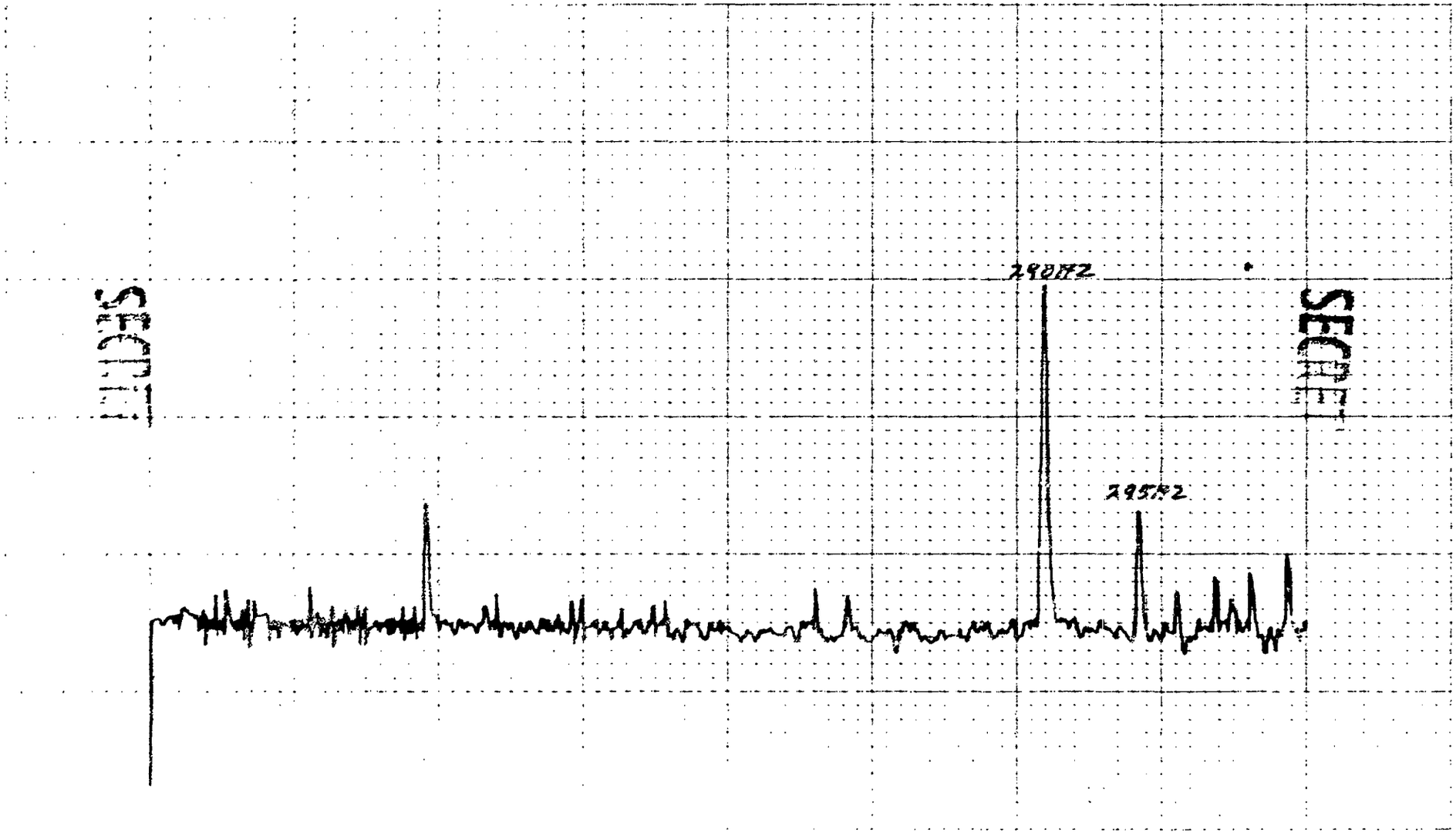
46 0703

CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-20 & 39-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+14 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -30 DB
WTG: HANNING

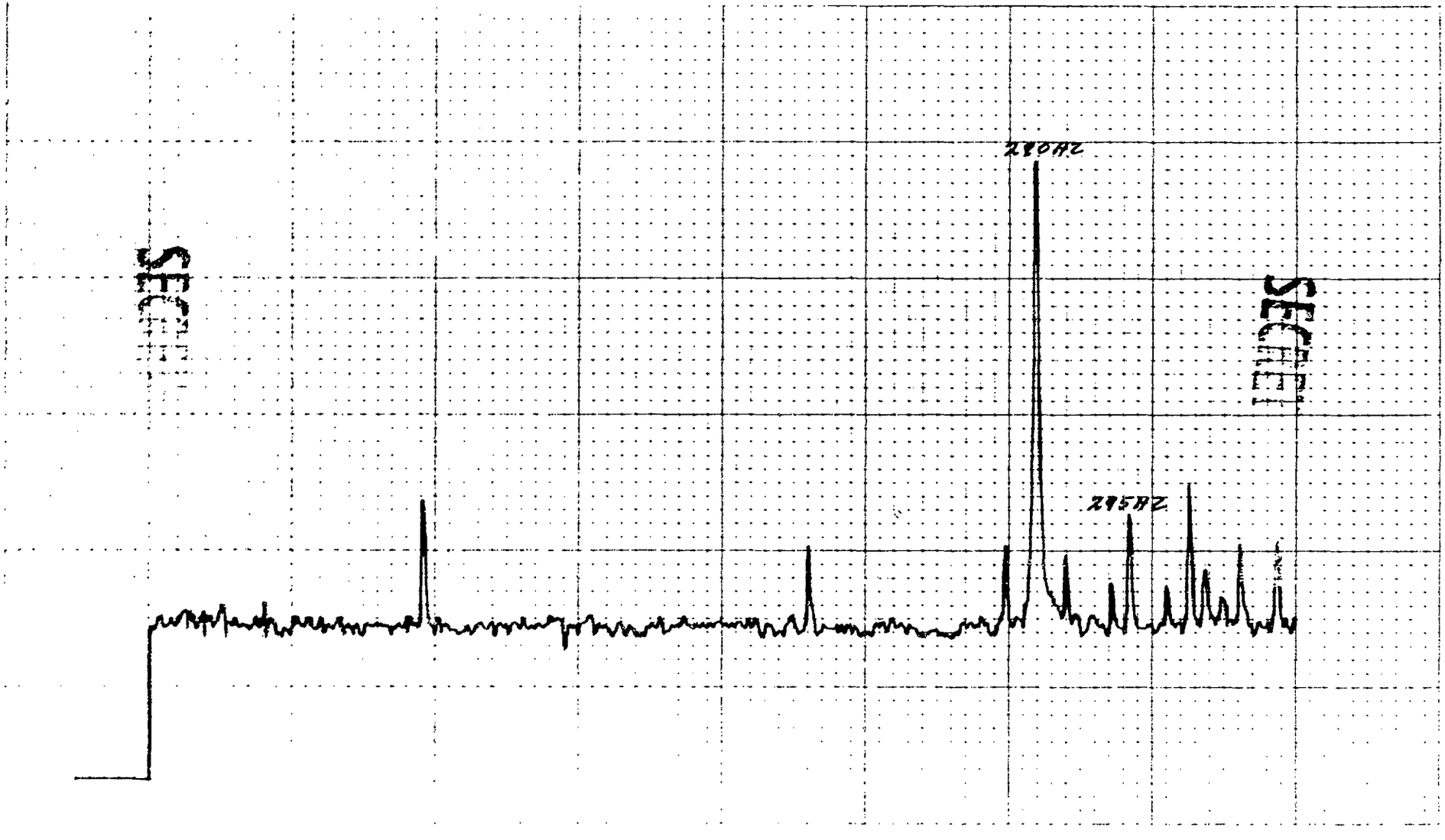


CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+16 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB

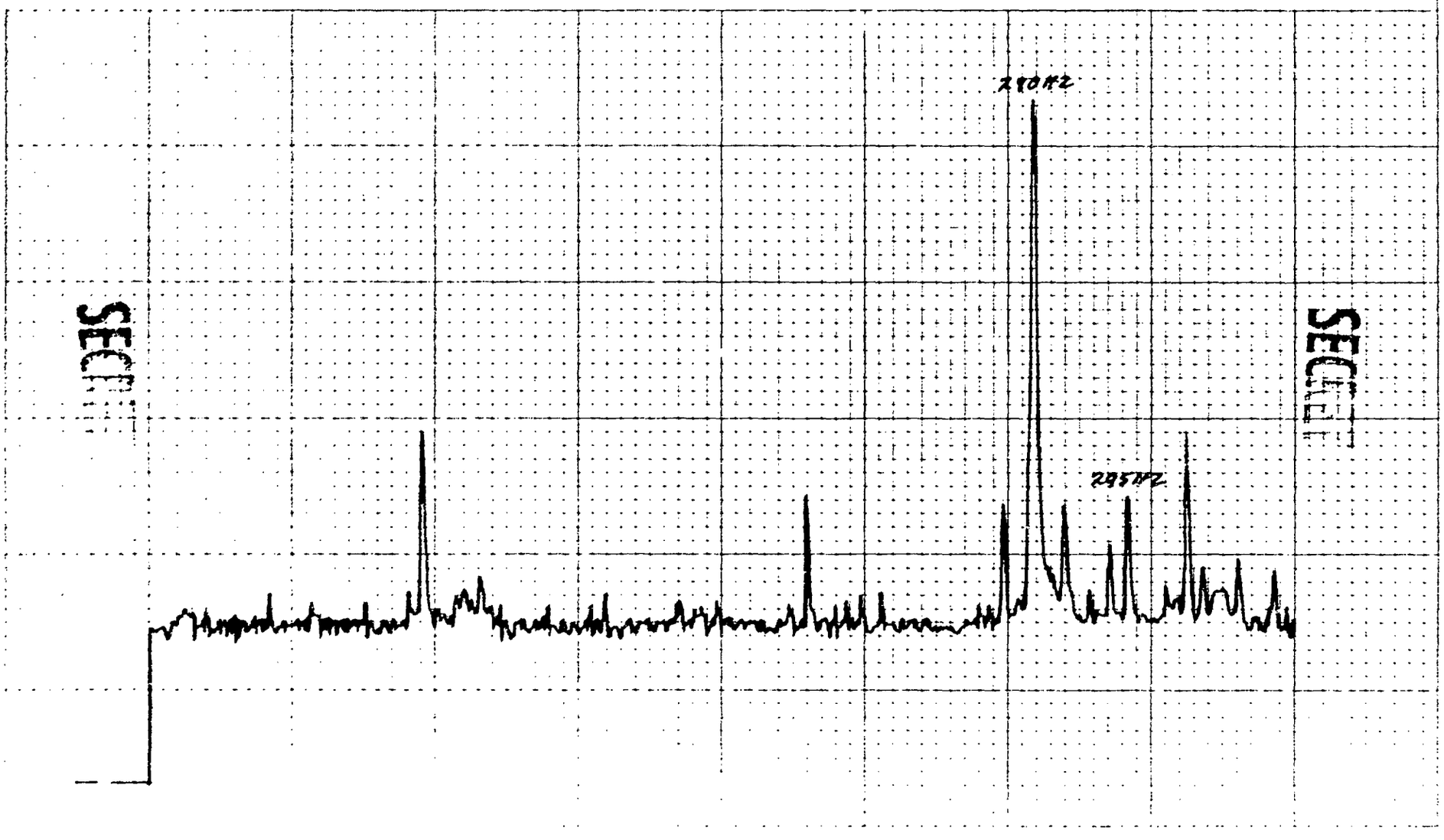


CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 8-14 & 16-20 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+18 DEG. AZ STEERING

REEL: 44
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB

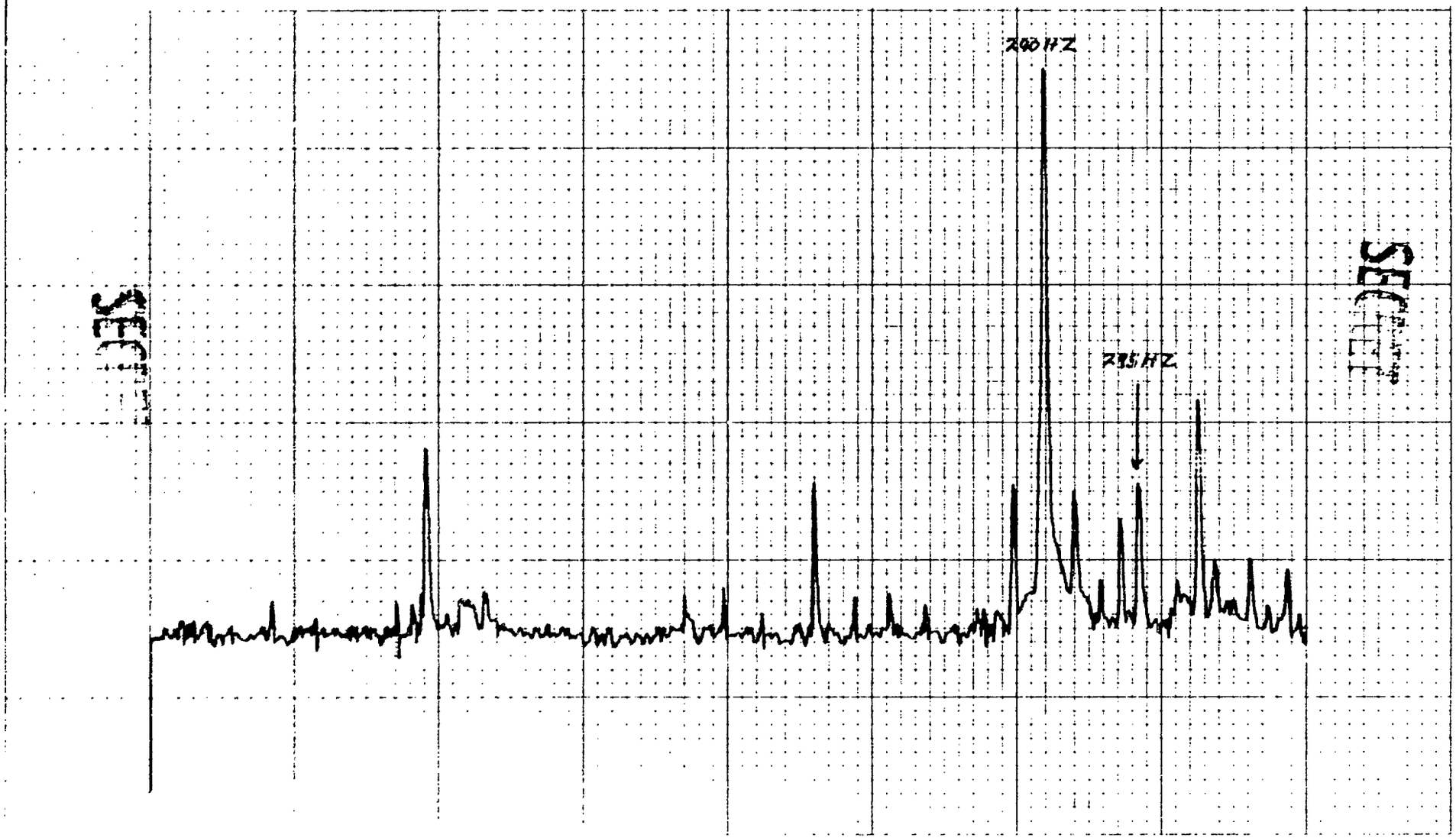


CONTROL: 1501 - 48 (DPE)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+19 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

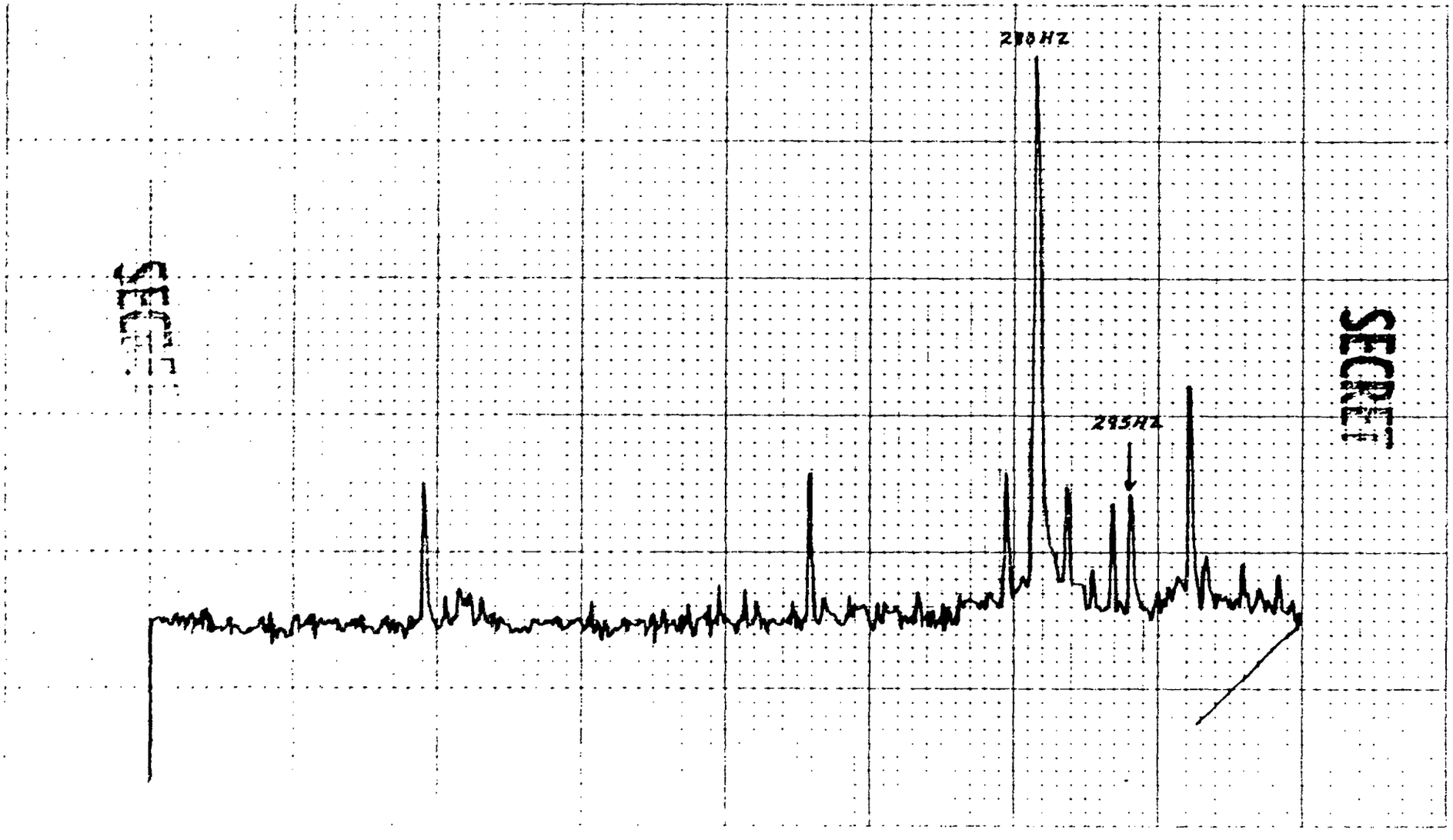
INDEX 3000
ATTEN: 30 DB



CONTROL: 150 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+20 DEG. AZ STEERING

REEL: M4
INDEX 3000
INTEGRATION TIME 320 SECS
ATTEN: 30 DB
FILTER WTG: HANNING

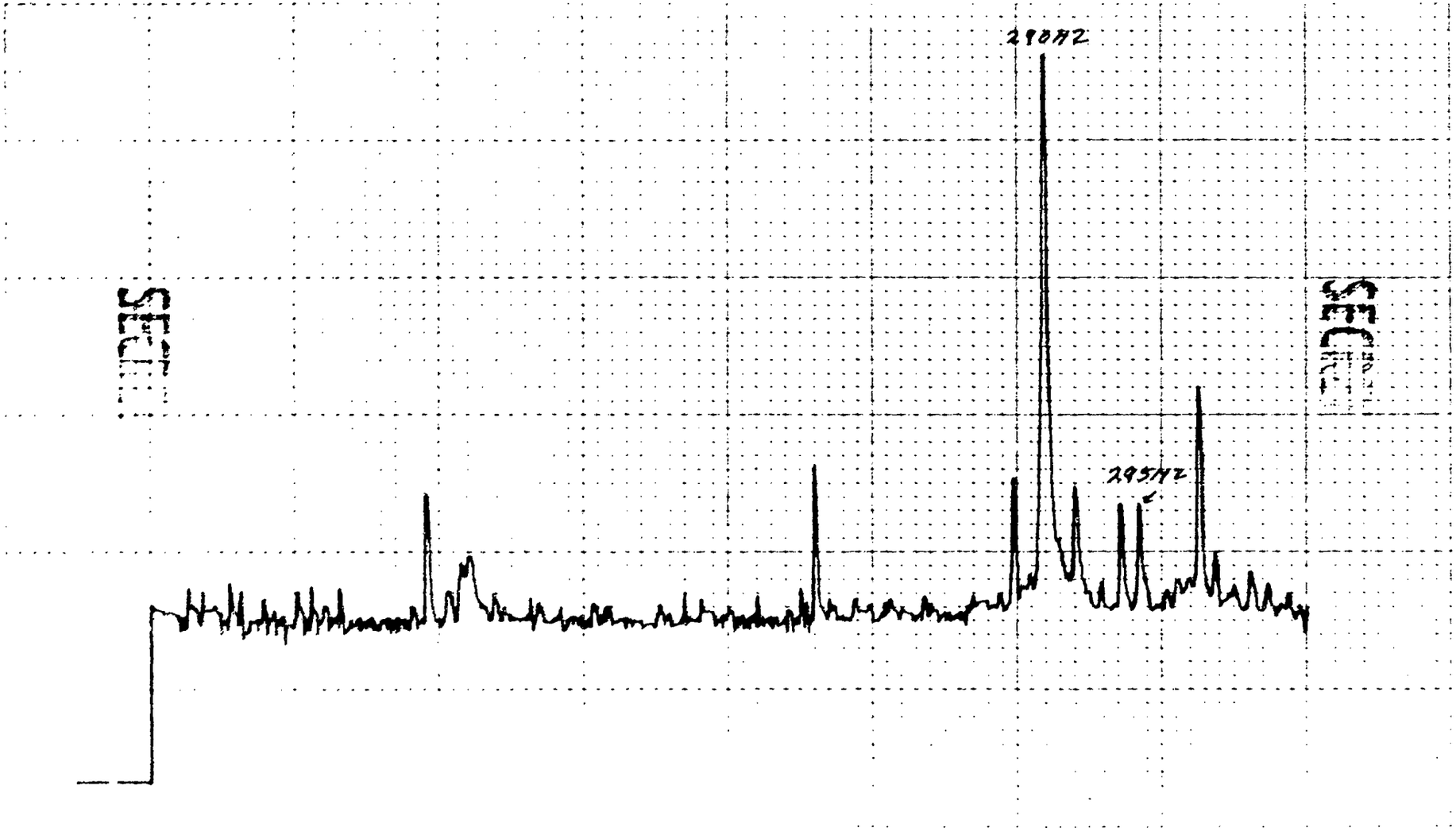


CONTROL: 1501 - 48 (DIE)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 38-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+21 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER

INDEX 3000
ATTEN: -30 DB
WTG: HANNING



K+E 10 X 10 TO THE INCH

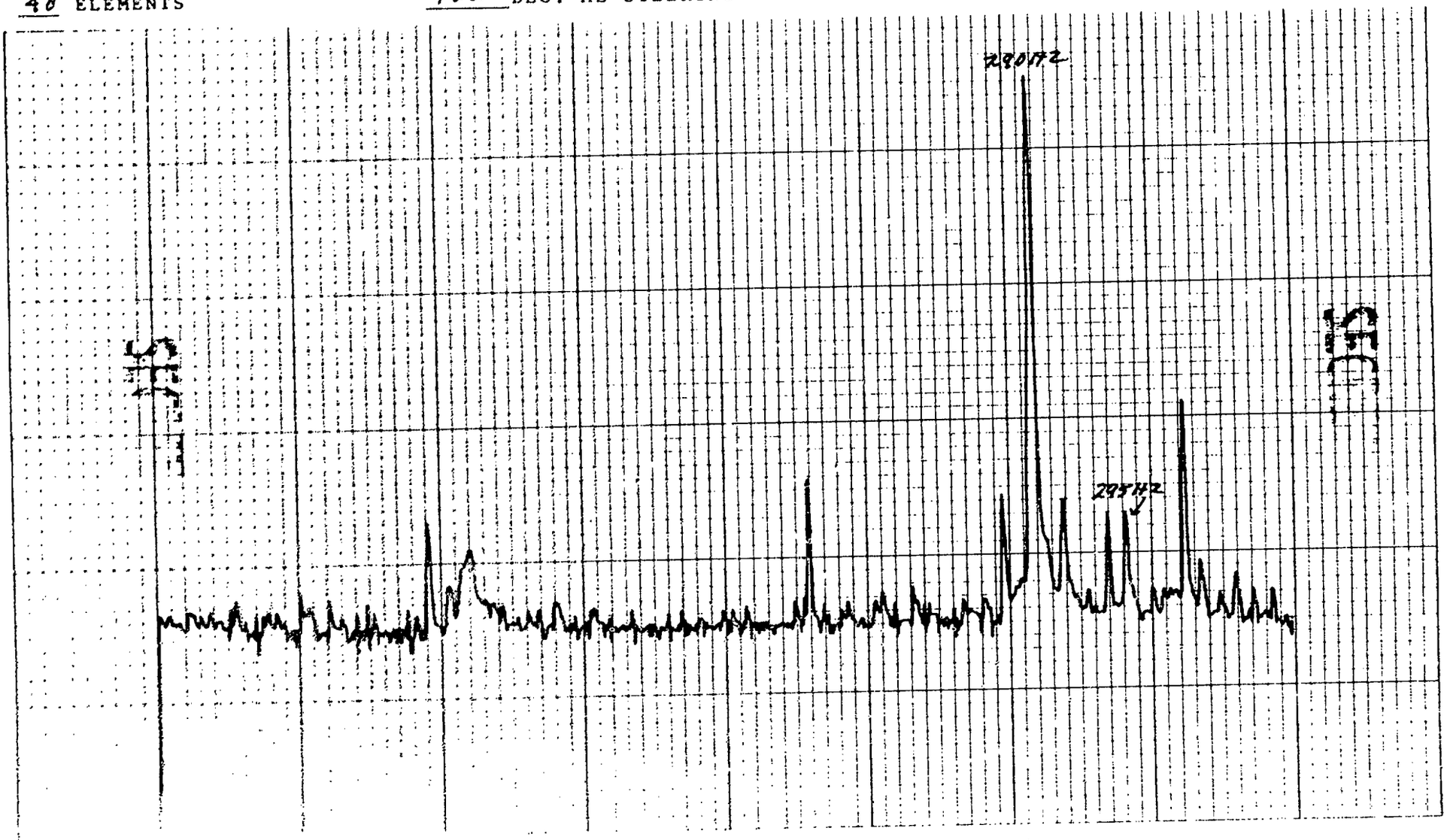
46 0703

CONTROL: 1501 - 48 (DPE)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+22 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB



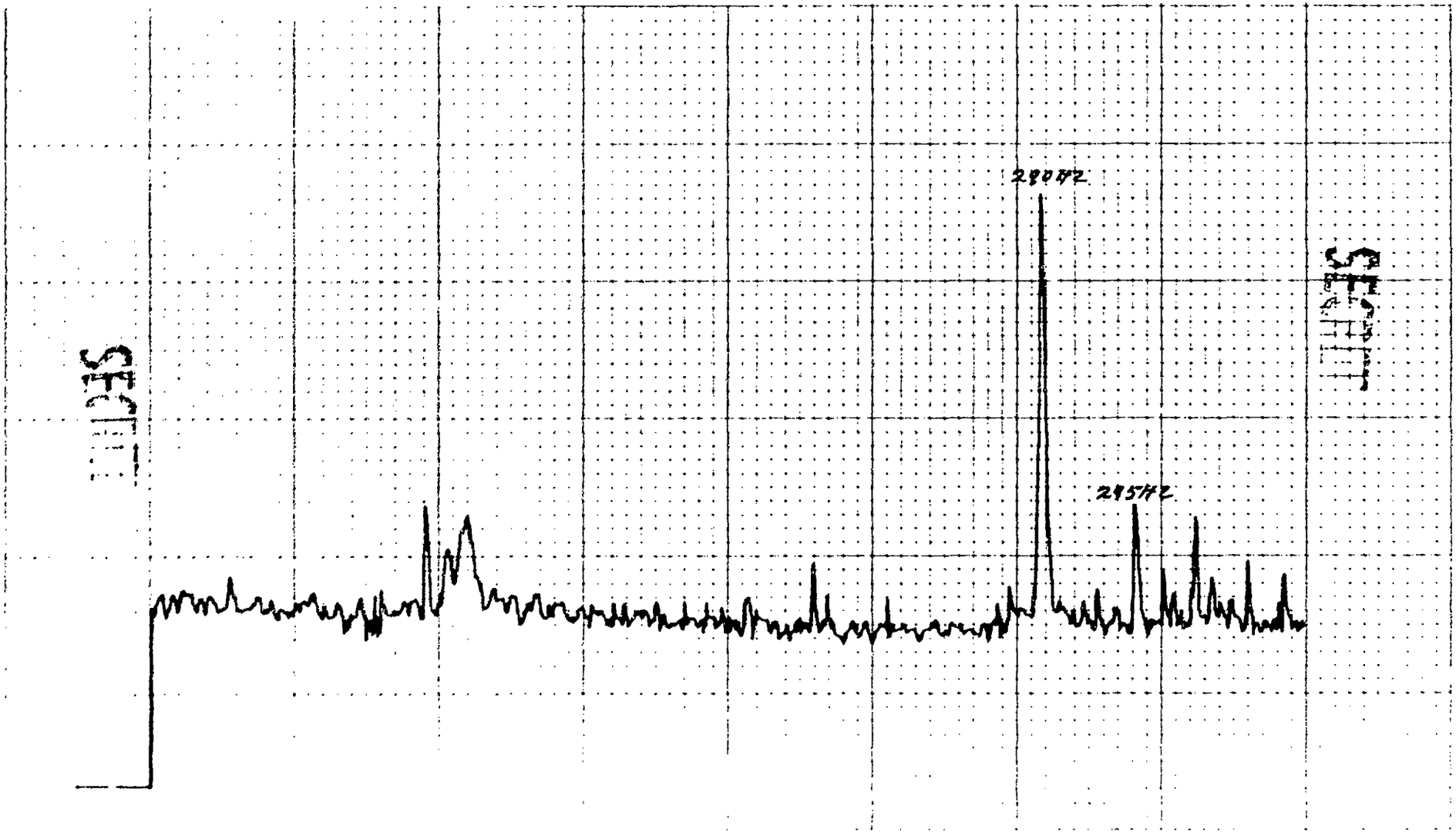
46 0703

CONTROL: 1501 - 48 (DPB)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 8-14 & 16-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+24 DEG. AZ STEERING

REEL: M4
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3000
ATTEN: -30 DB

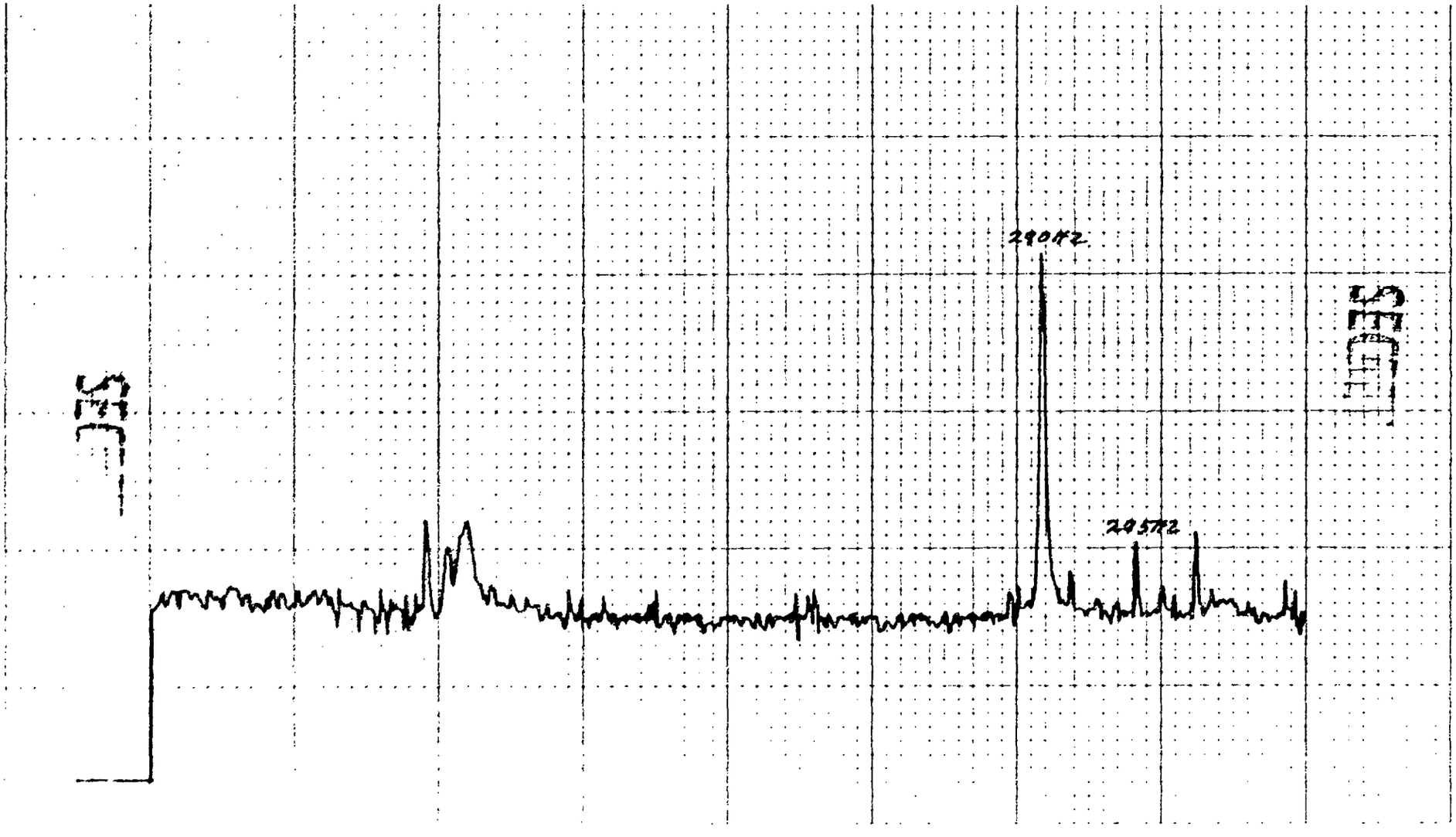


46 0703

CONTROL: 1501 - 48 (DOE)
BEAMFORMED SPECTRUM(ELEMENTS 1-6 & 9-14 & 16-26 & 39-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
48 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 1501 Z
ANALYSIS BANDWIDTH: 1/10HZ
+26 DEG. AZ STEERING

REEL: K4
INDEX 3000
INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 9 DATE 3-15-77 TIME 2131Z

FREQUENCY 140 HZ

INDICATED NOISE LEVEL dBV/ABW			-52.0
SYSTEM SENSITIVITY dB/μB	-(-12)	=	-40.0
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	=	-31.8
CONVERSION TO dBrepPa/1HZ	+100	=	+68.2

UNCLASSIFIED

UNCLASSIFIED

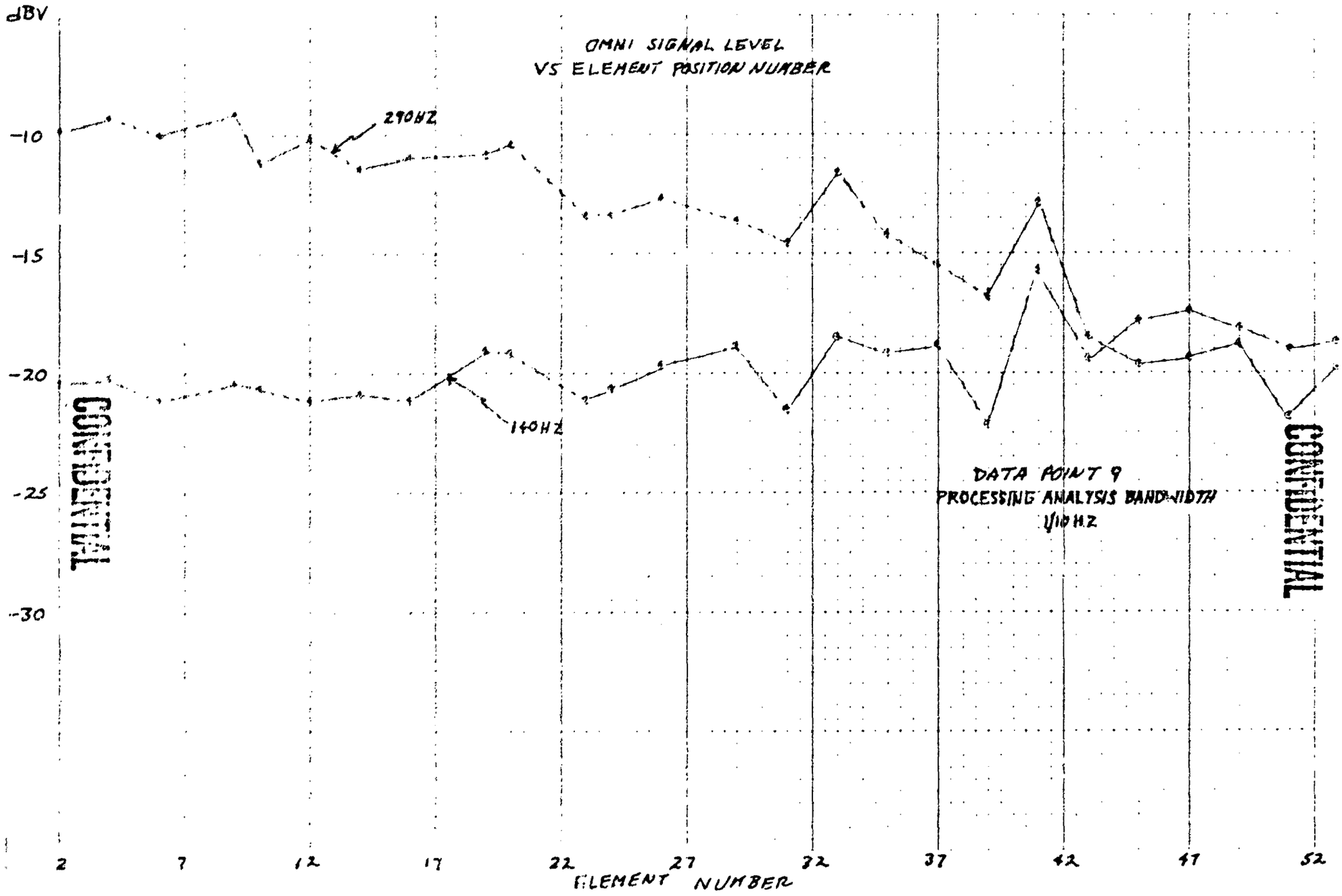
NOISE SPECTRAL DENSITY CALCULATIONS FOR SPRAY/BEARING STAKE (U)

DATA POINT 9 DATE 3-15-77 TIME 2130Z

FREQUENCY 290 HZ

INDICATED NOISE LEVEL dBV/ABW	1.0		-51.0
SYSTEM SENSITIVITY dB/μB	-(-9)	=	-43.0
BANDWIDTH CONVERSION TO 1 HZ BAND	+8.2	=	-34.8
CONVERSION TO dBreμPa/1HZ	+100	=	+65.2

UNCLASSIFIED



46 0703

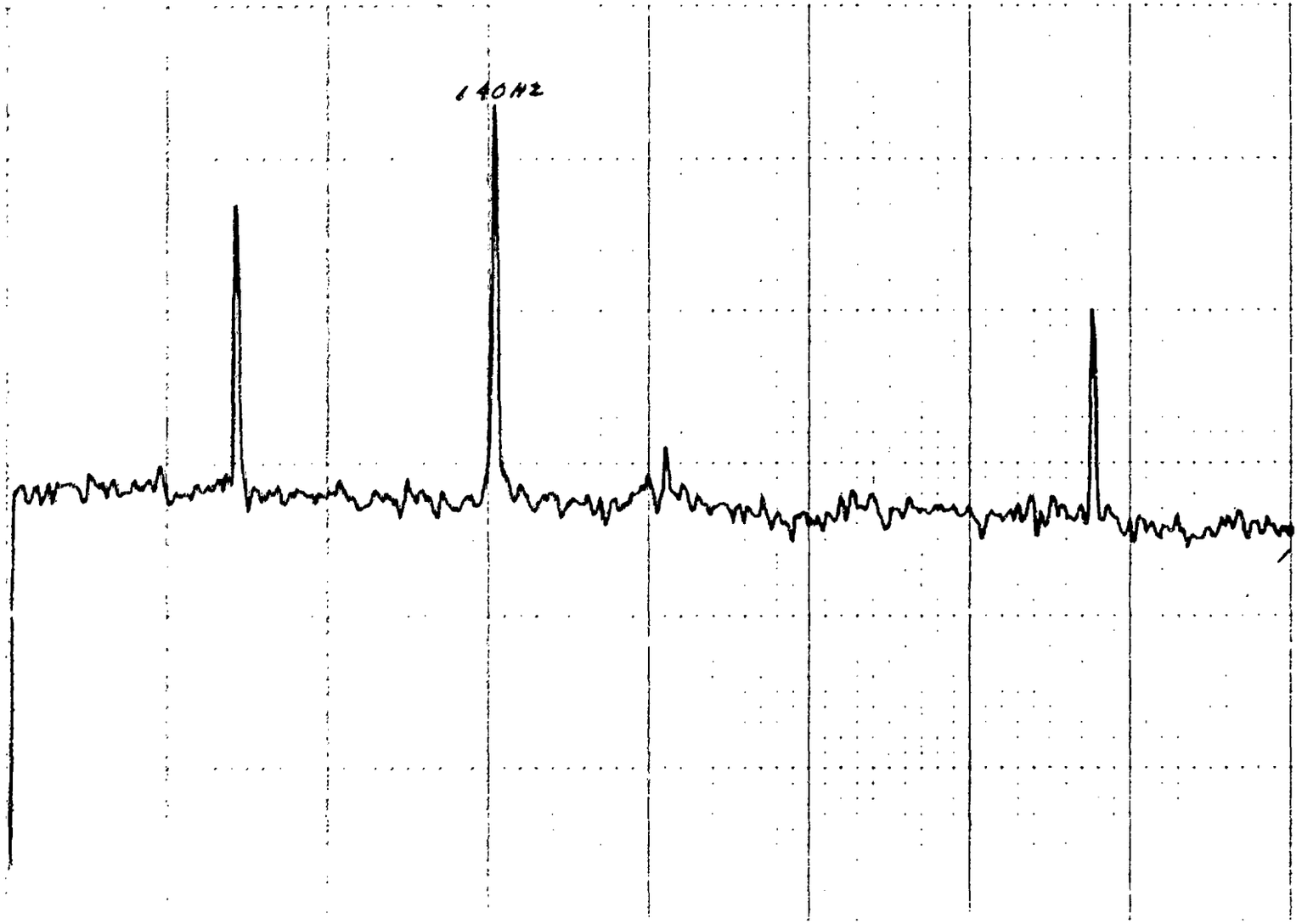
CONTROL: 3-15-2131 (27)
OMNI SPECTRUM(ELEMENT 2)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

SECRET

46 0703

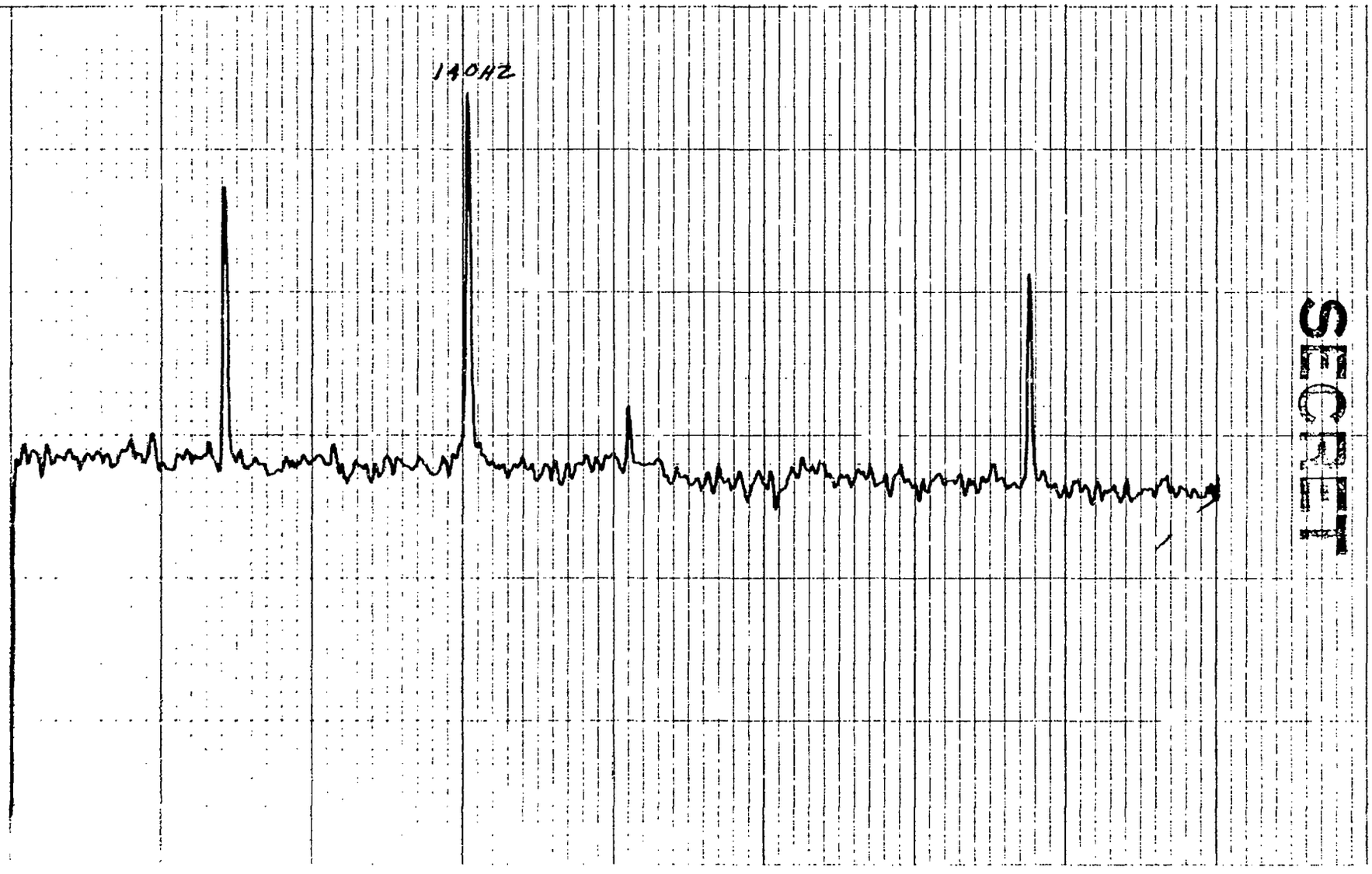
CONTROL: 345-2131 (28)
OMNI SPECTRUM(ELEMENT 4)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 245-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WT: HANNING



SECRET

46 0703

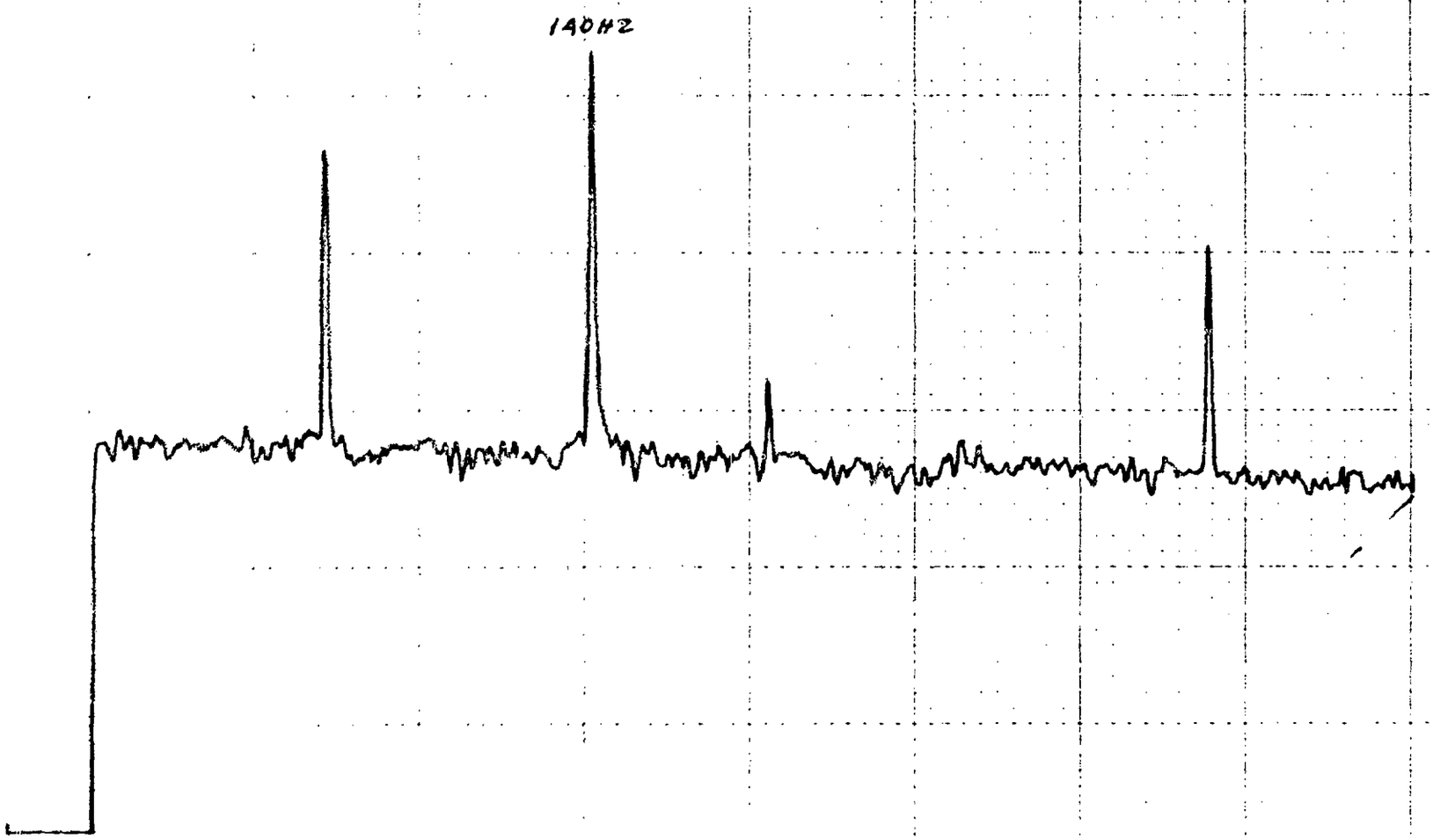
CONTROL: 345 - 2131 (29)
OMNI SPECTRUM (ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 345-77 - 2131
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

SECRET

46 0703

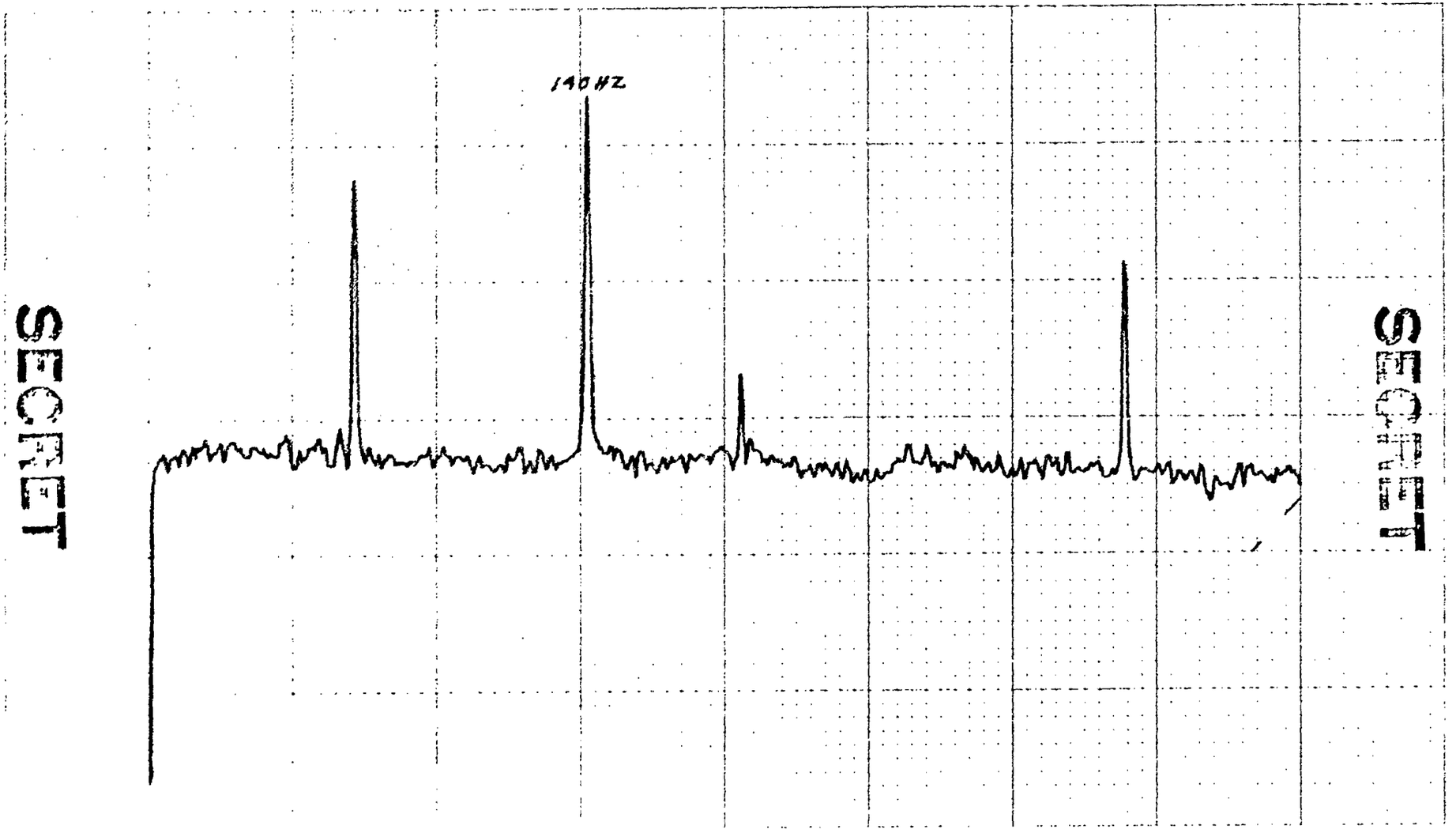
CONTROL: 345 - 2131 (30)
OMNI SPECTRUM (ELEMENT 9)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 345-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
____ DEG AZ STEERING

REEL: M10 INDEX 3620°

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

SECRET

46 0703

CONTROL: 345 - 2131 (31)
OMNI SPECTRUM(ELEMENT 10)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 345-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

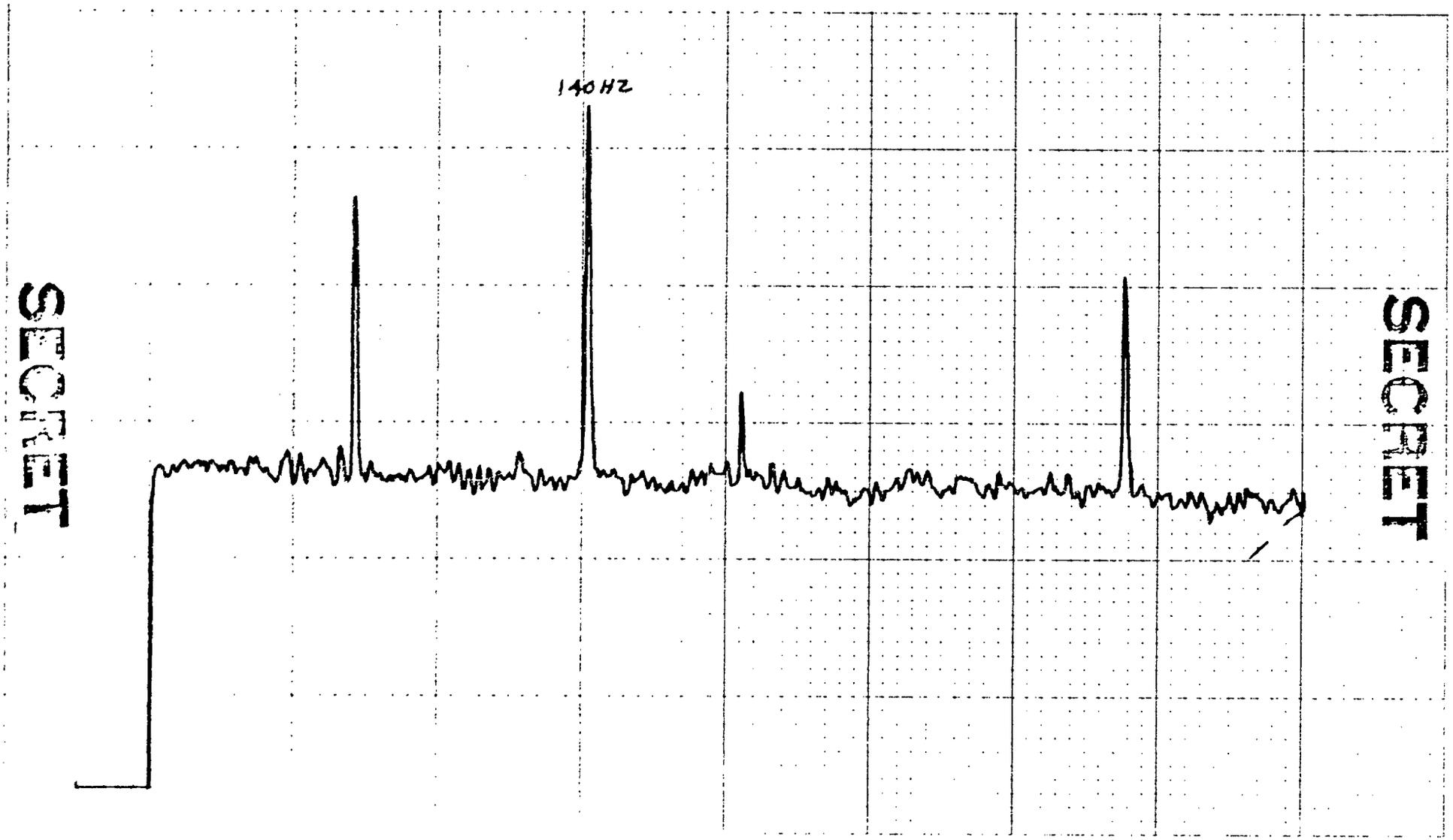
CONTROL: 345-2131 (32)
OMNI SPECTRUM(ELEMENT 12)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME:345-77 - 2131 Z
ANALYSIS BANDWIDTH:1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3690

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

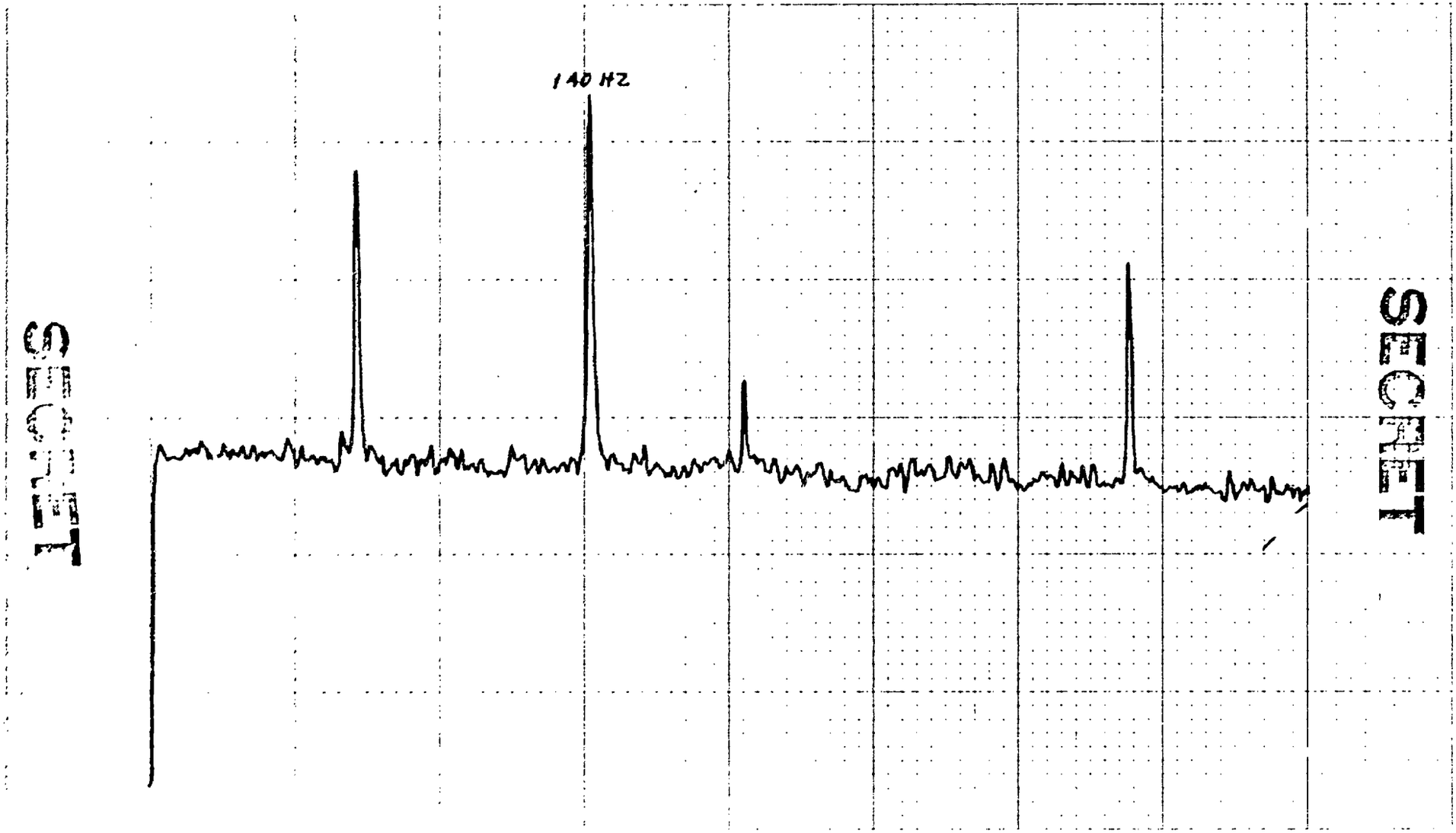
CONTROL: 3-15 - 2131 (33)
OMNI SPECTRUM(ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

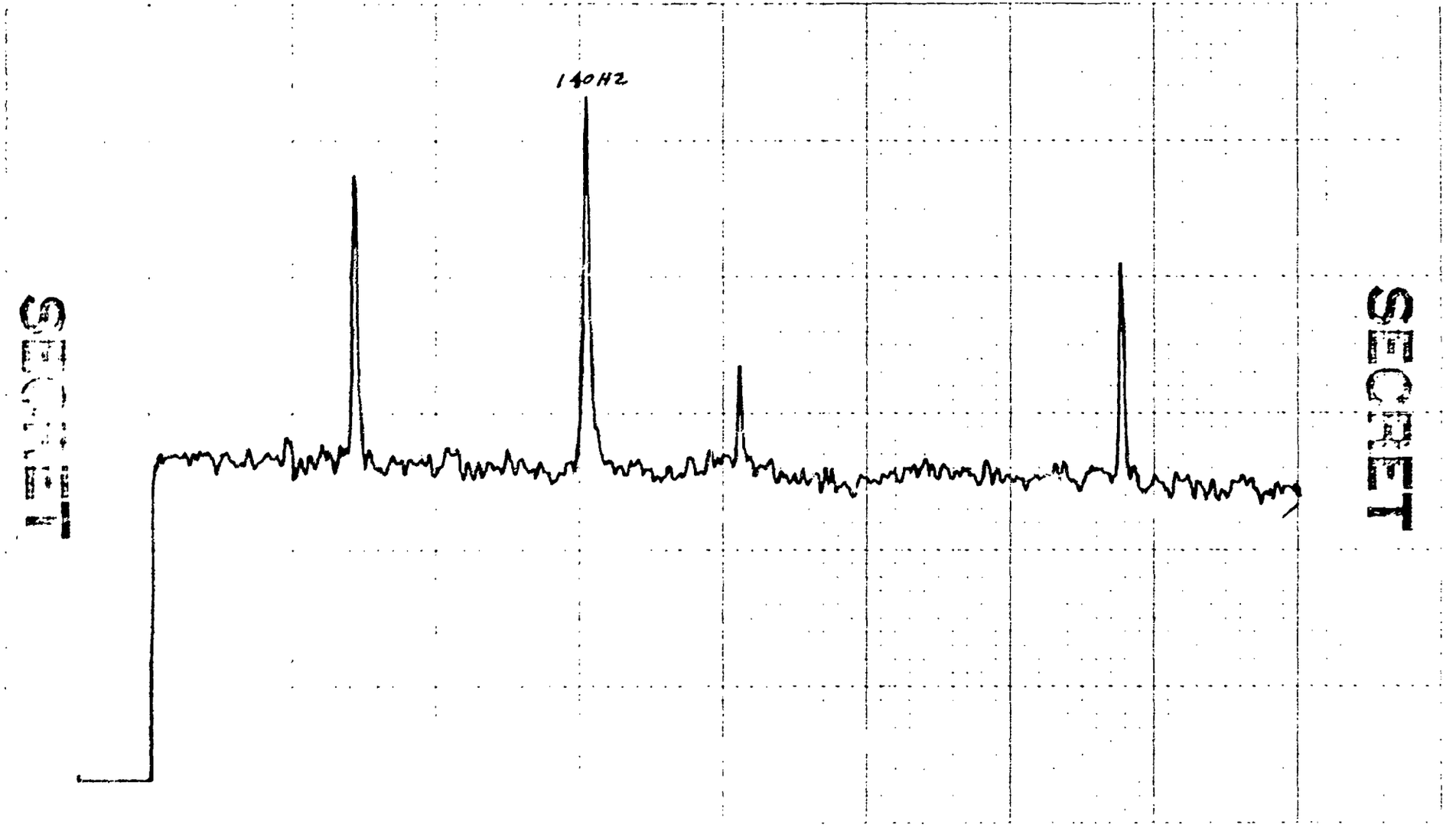
CONTROL: 3-15 -2131 (34)
OMNI SPECTRUM (ELEMENT 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
_____ DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



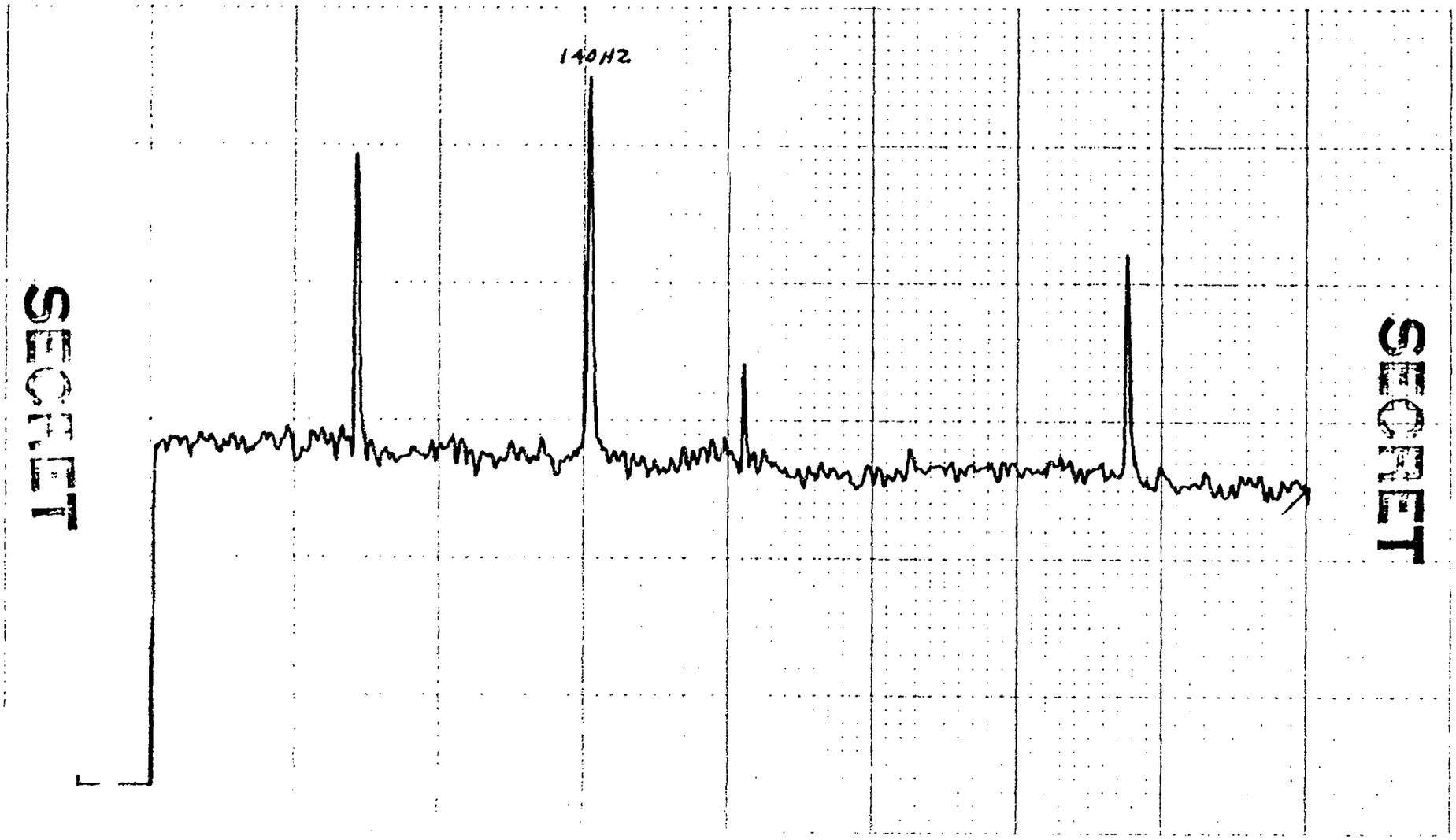
CONTROL: 3-15 - 2131 (35)
OMNI SPECTRUM(ELEMENT 18)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: 1410 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



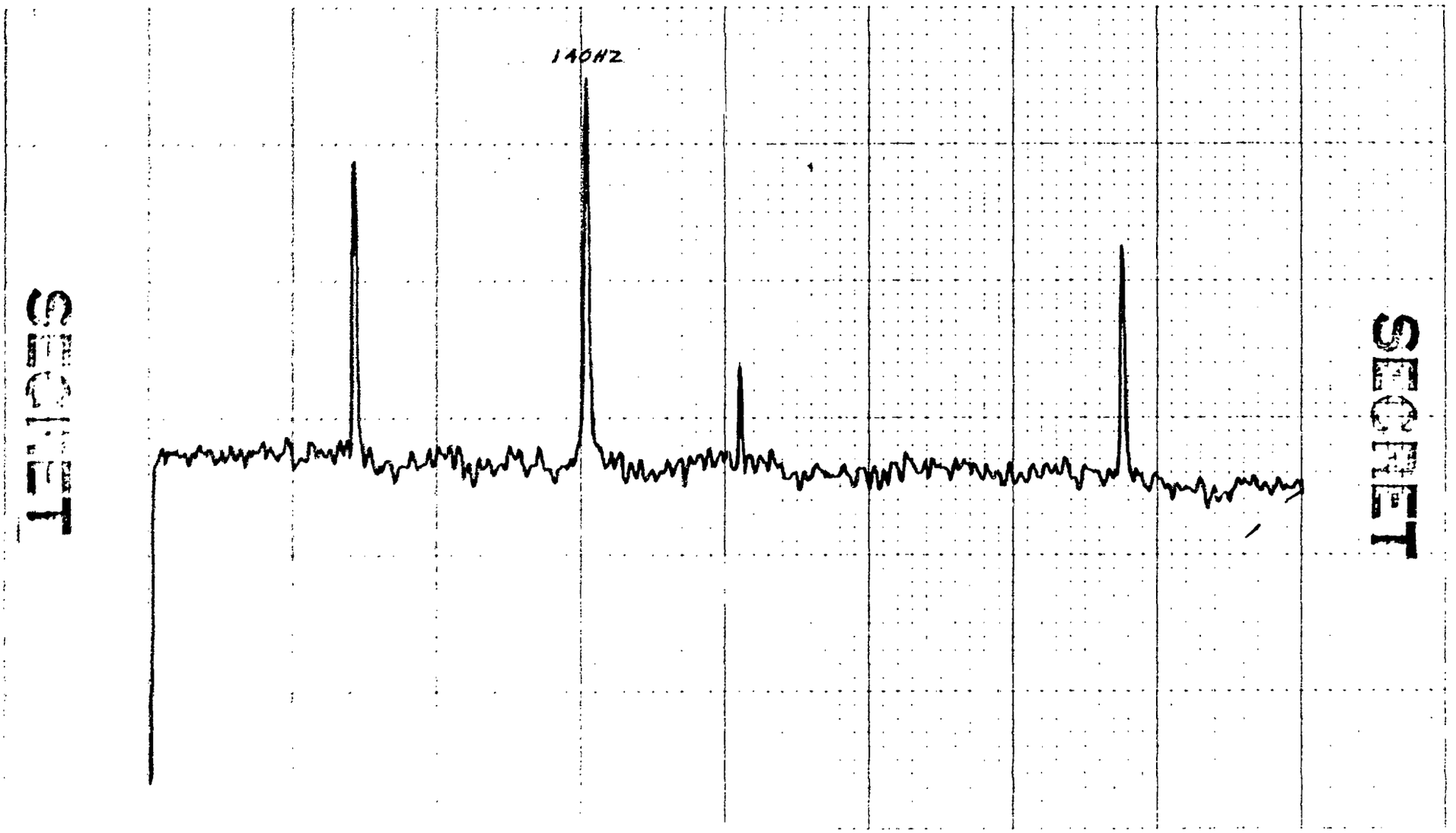
CONTROL: 3-15 -2131 (36)
OMNI SPECTRUM(ELEMENT 20)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

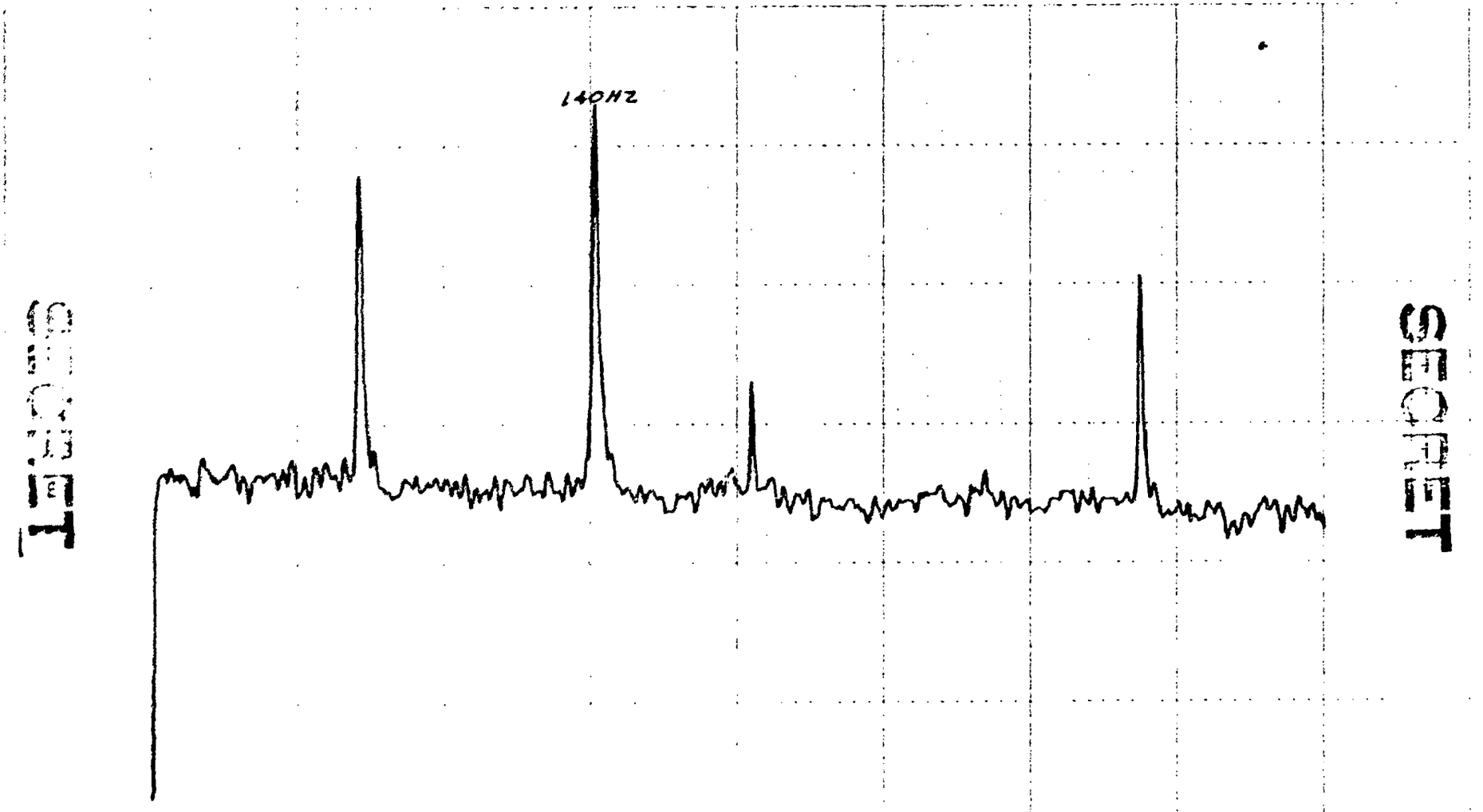
CONTROL: 3-15 - 2131 (37)
OMNI SPECTRUM(ELEMENT 23)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

46 0703

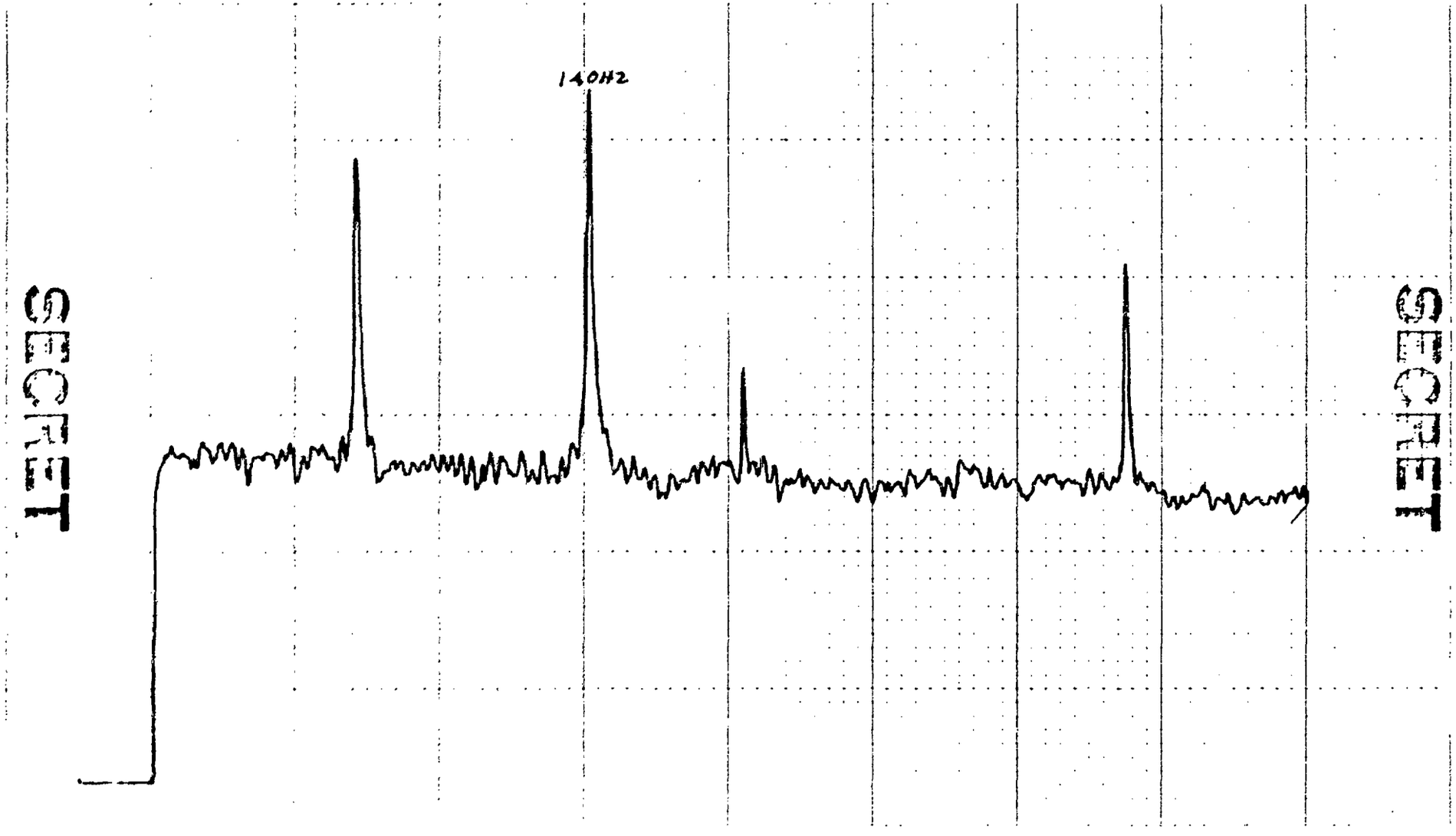
CONTROL: 345 -2131 (38)
OMNI SPECTRUM(ELEMENT 24)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 345-77 -2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

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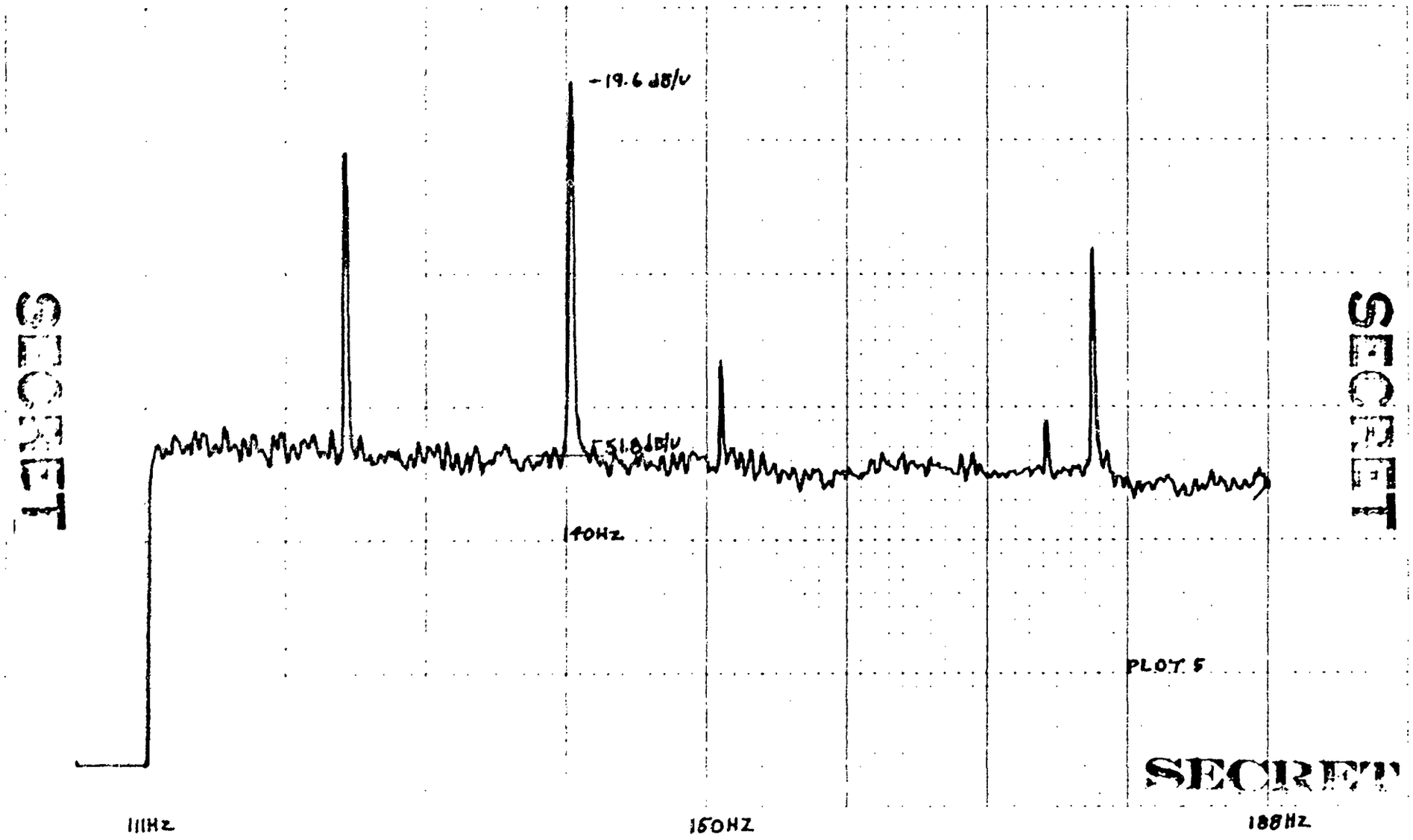
CONTROL: 2131 - 51 (DP9)
OMNI SPECTRUM (ELEMENT 26)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



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46 0703

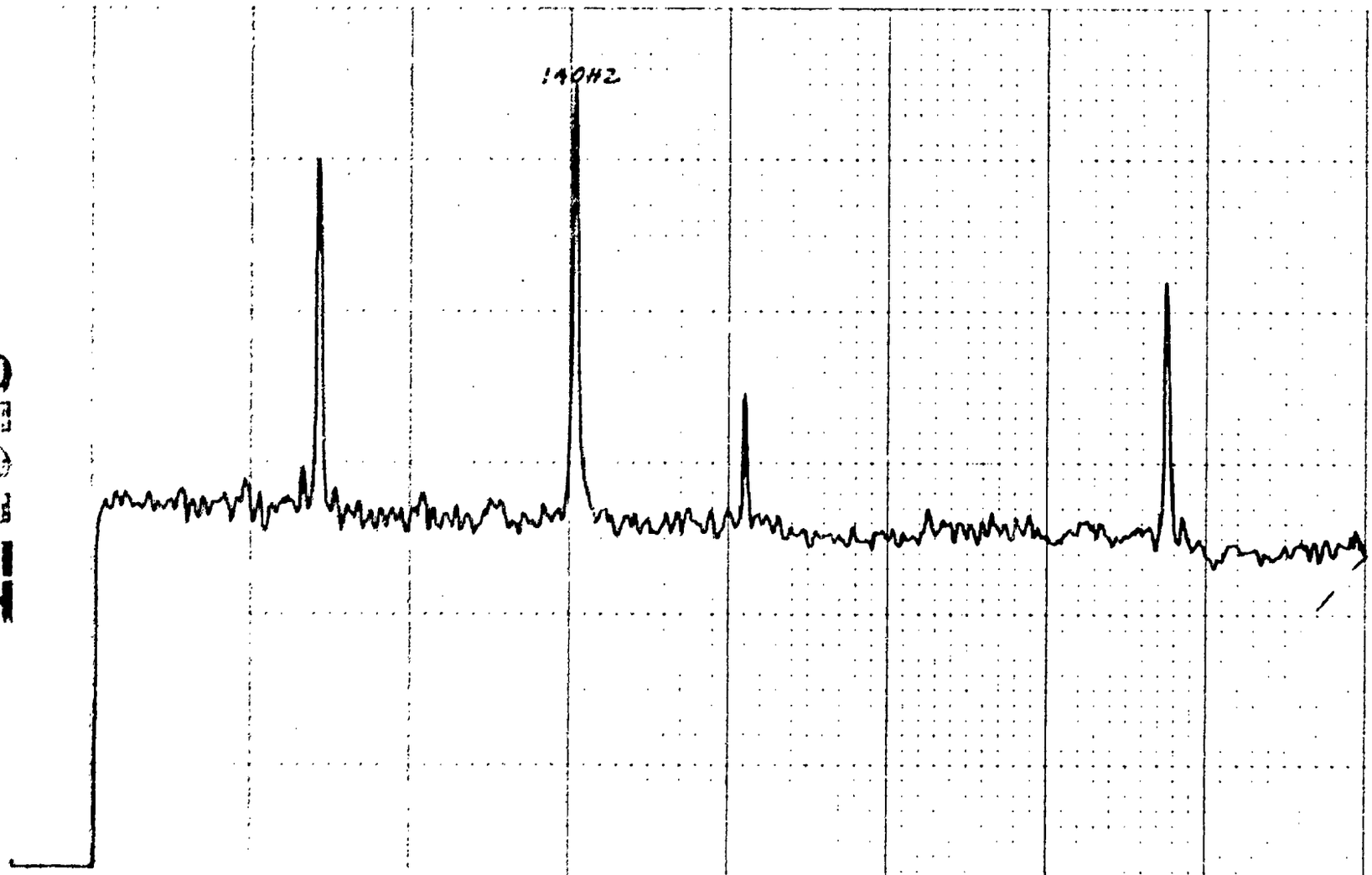
CONTROL: 3-15 -2131 (40)
OMNI SPECTRUM(ELEMENT 29)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

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46 0703

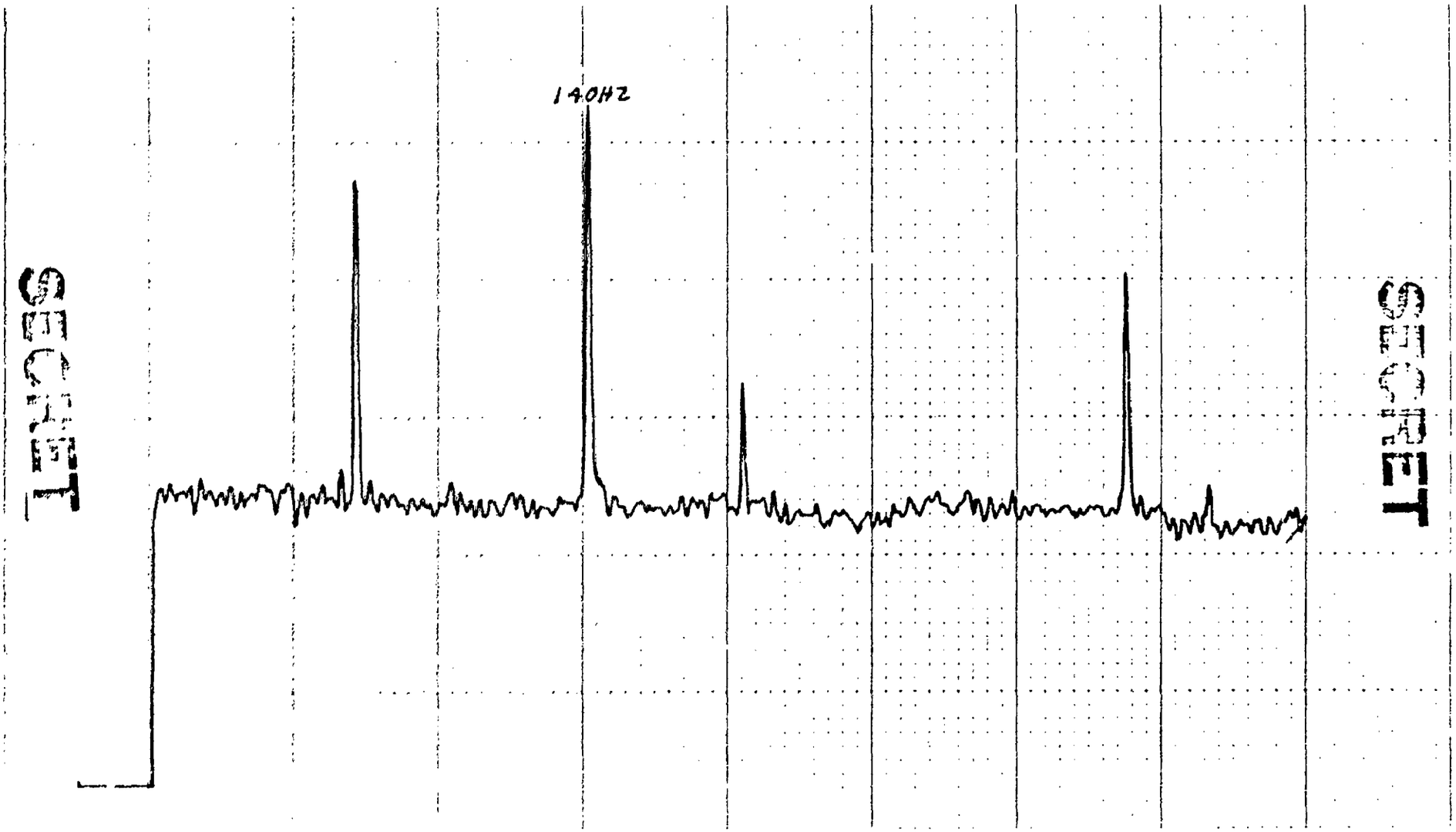
CONTROL: 7-15 - 2131 (41)
OMNI SPECTRUM(ELEMENT 31)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



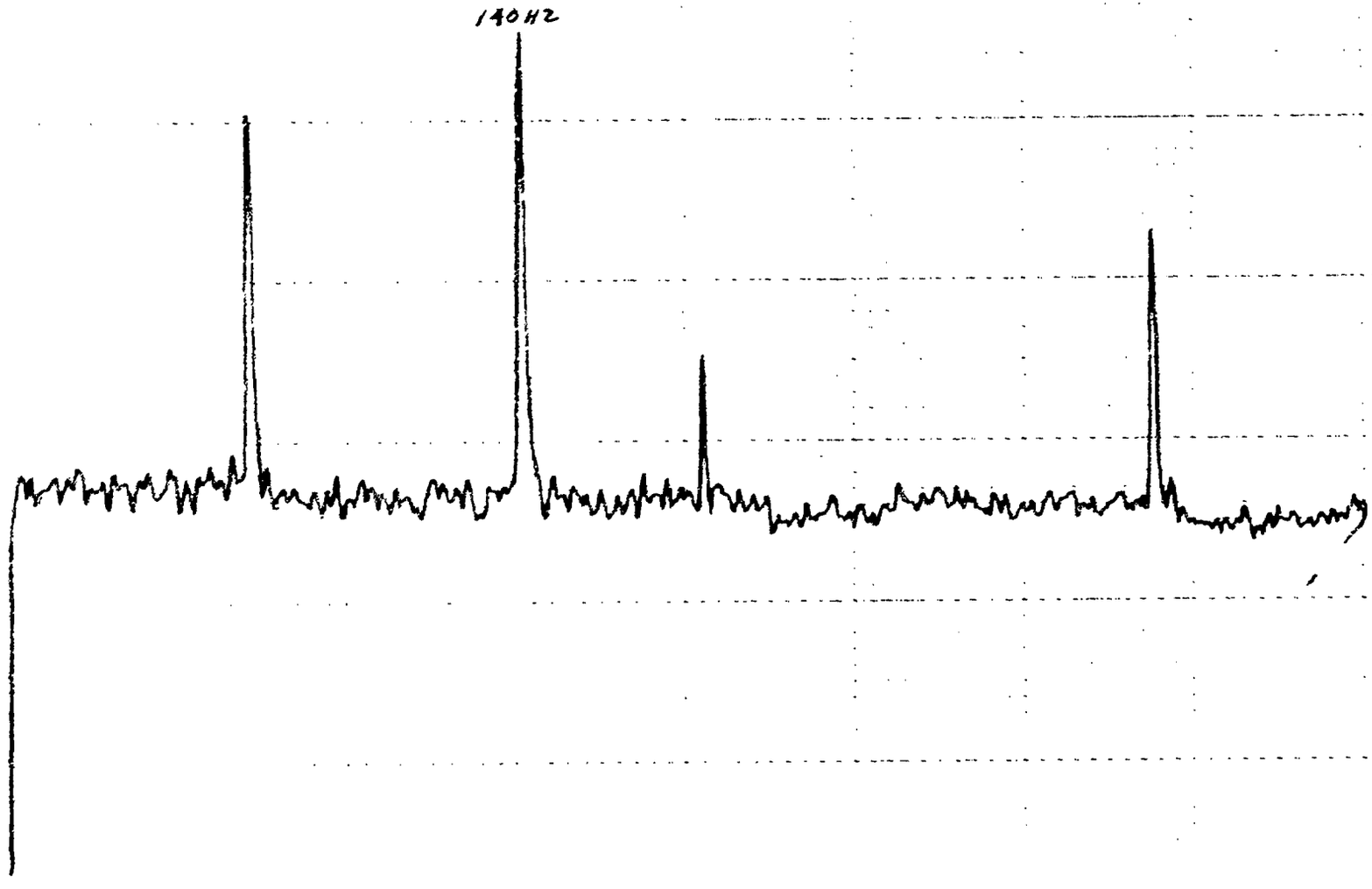
CONTROL: 345-2131 (42)
OMNI SPECTRUM (ELEMENT 33)
EXERCISE: BEAPING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



SECRET

46 0703

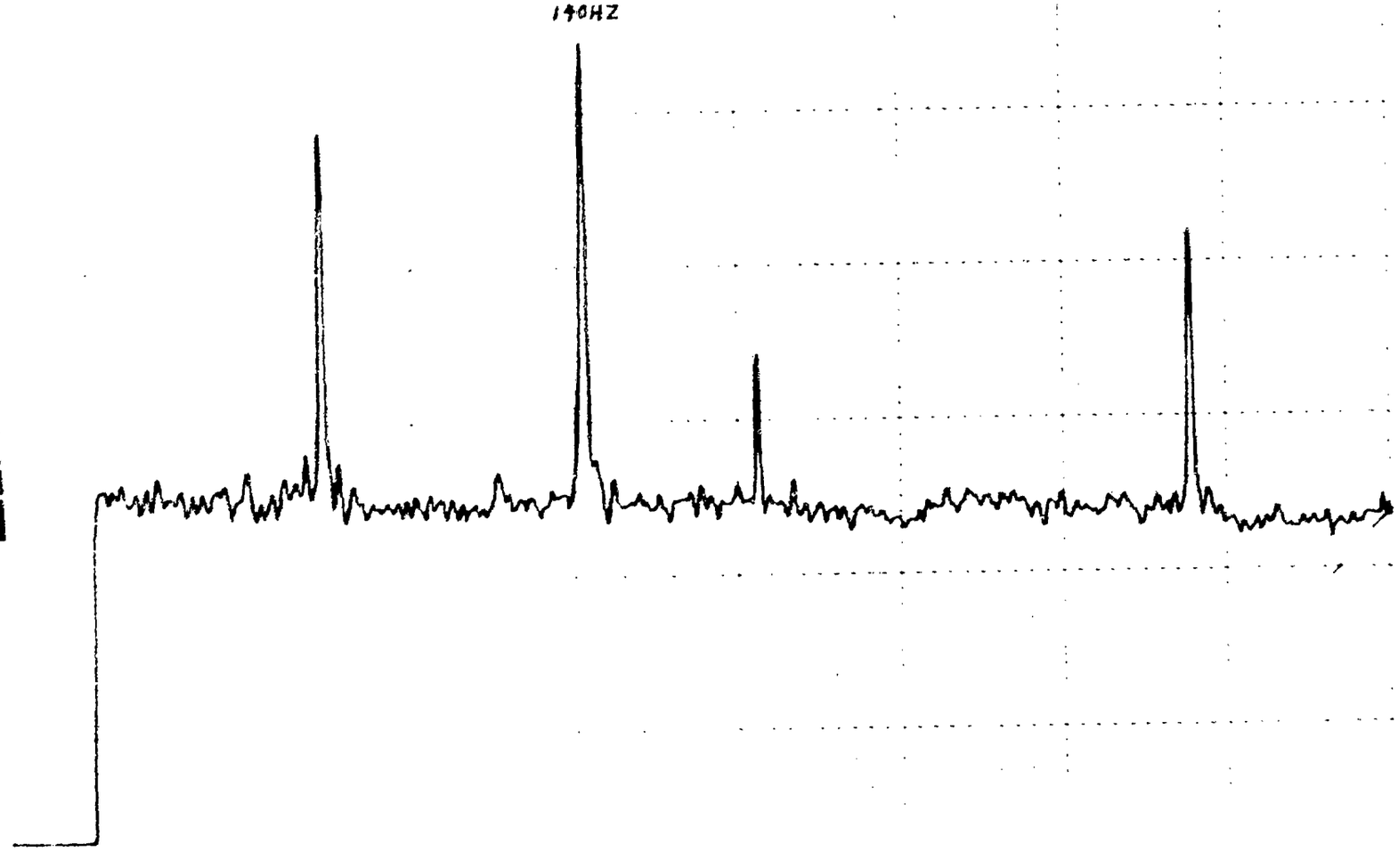
CONTROL: 2131 - 51 (BPG)
OMNI SPECTRUM (ELEMENT 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
- DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



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46 0703

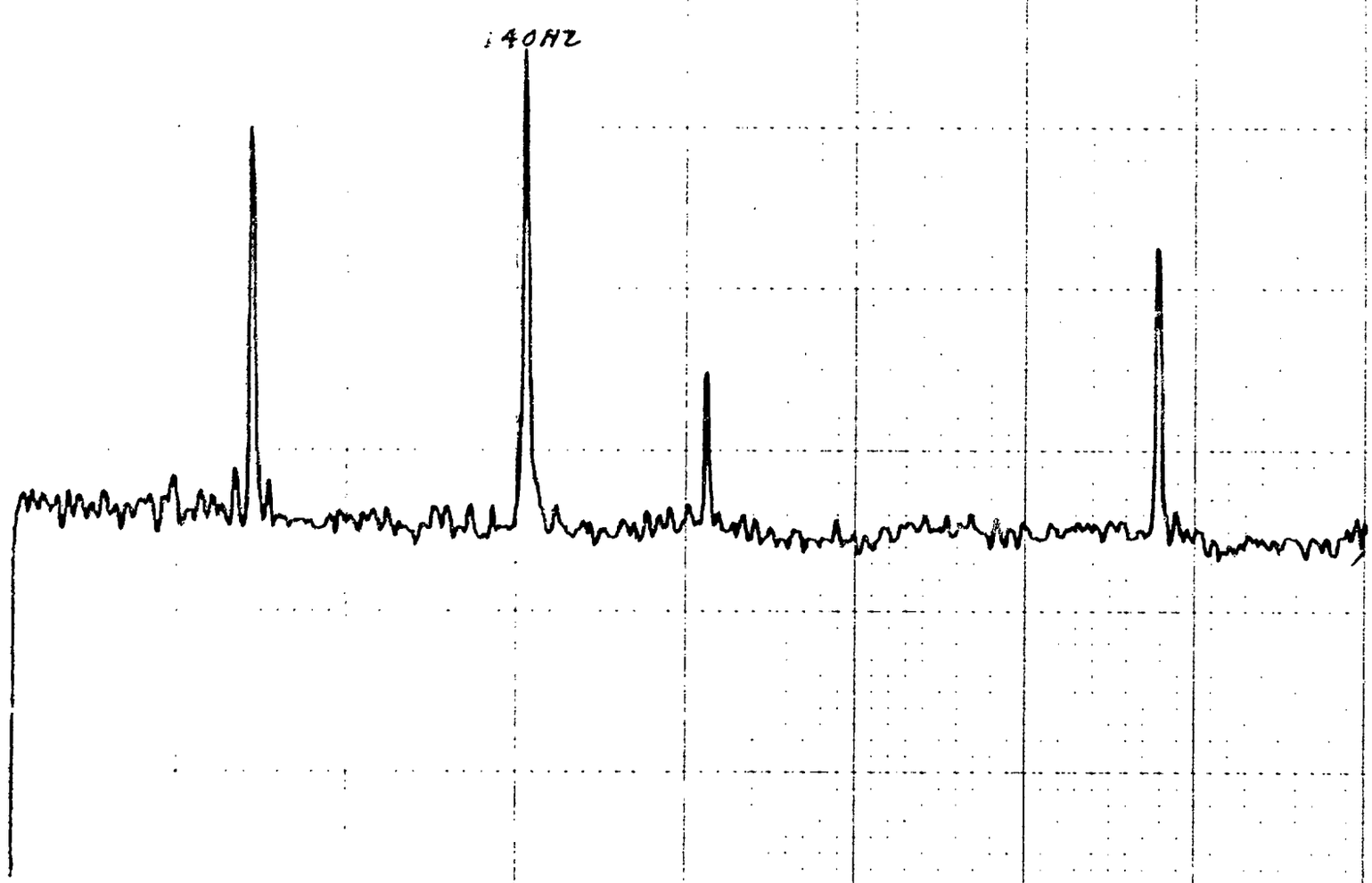
CONTROL: 3-15 - 2131 (44)
OMNI SPECTRUM(ELEMENT 37)
EXEPCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
—— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

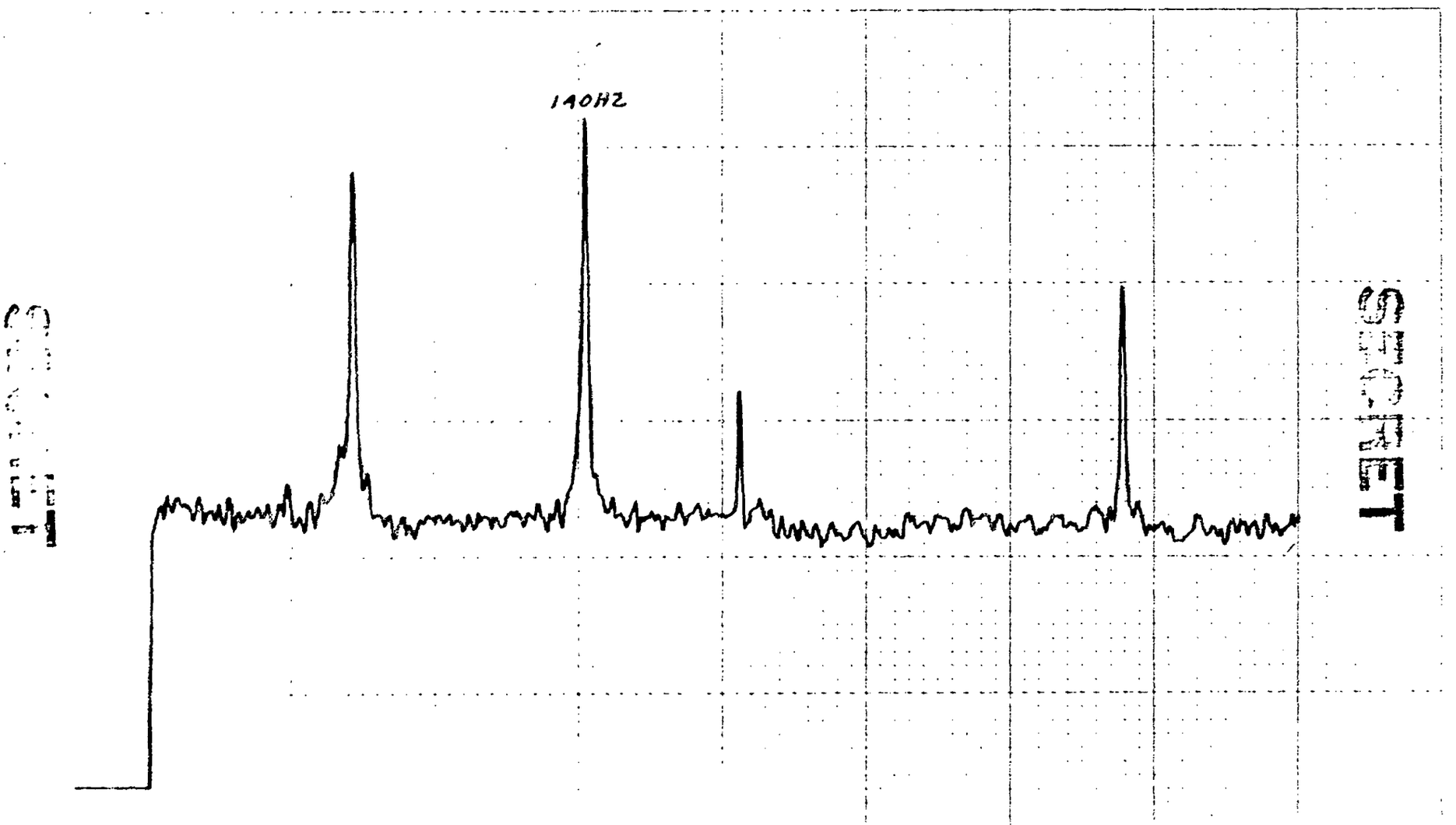
CONTROL: 3-15 - 2131 (45)
OMNI SPECTRUM(ELEMENT 39)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

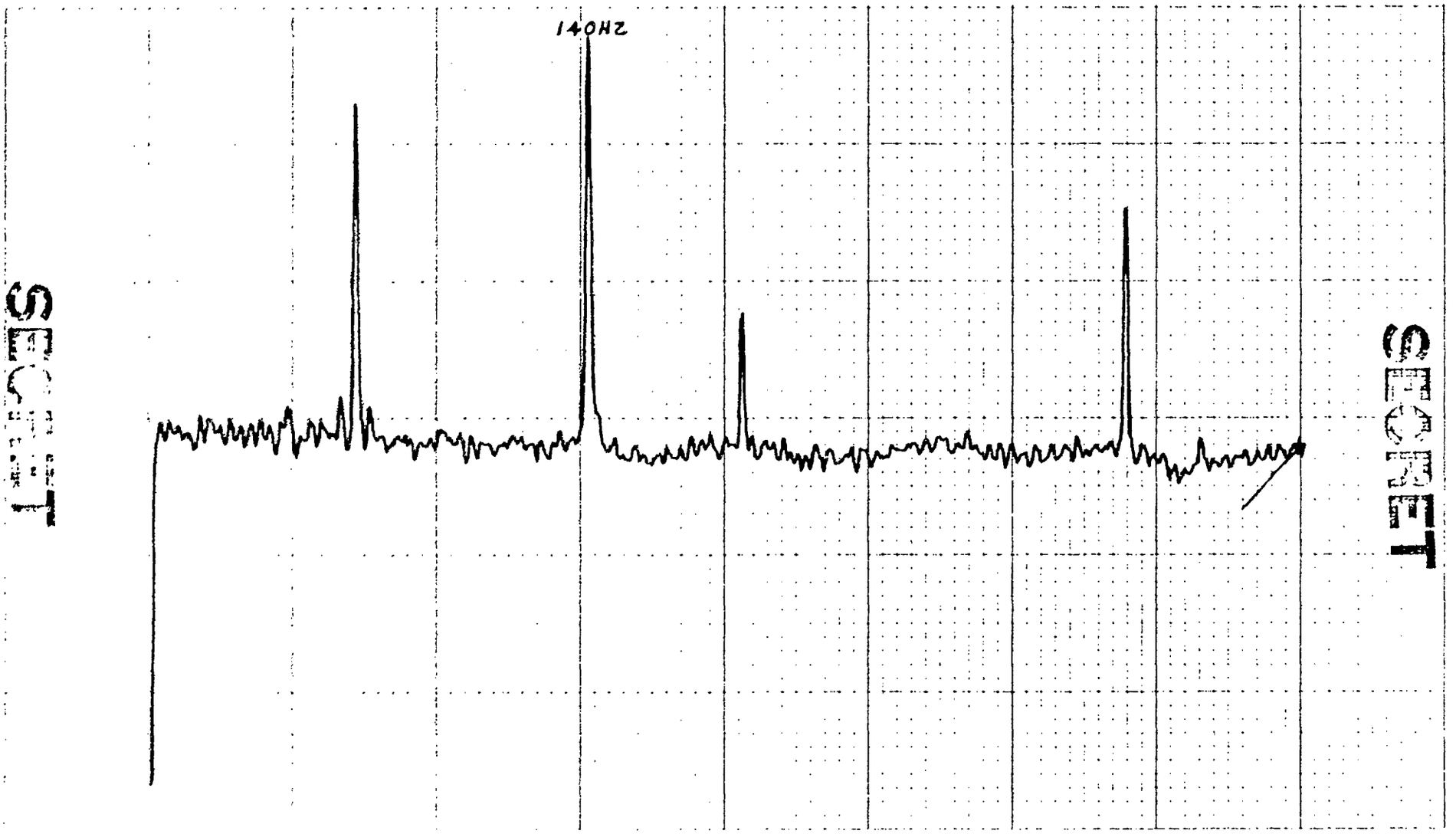
CONTROL: 3-15 -2131 (41)
OMNI SPECTRUM(ELEMENT 41)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

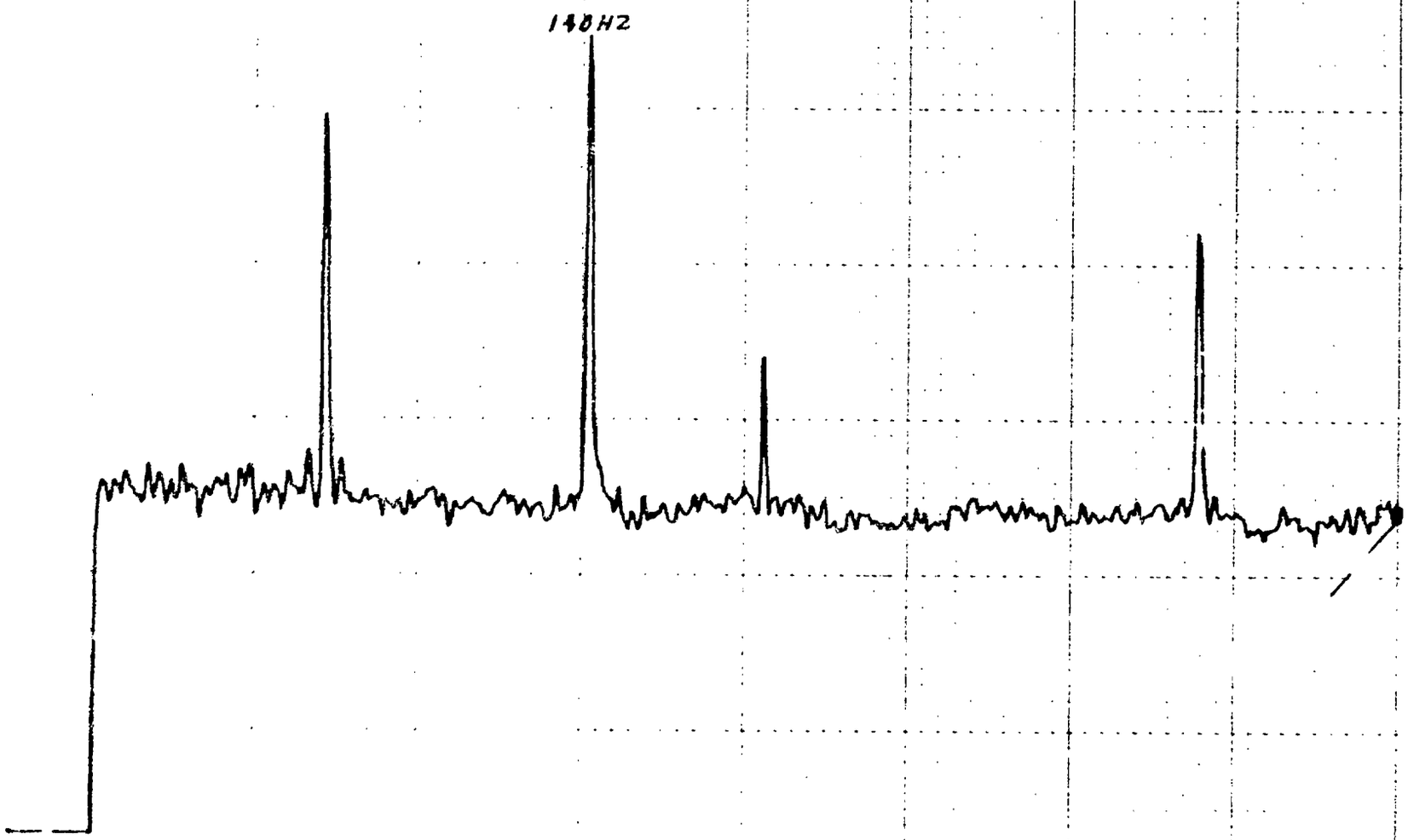
CONTROL: 345 - 2131 (47)
OMNI SPECTRUM(ELEMENT 43)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

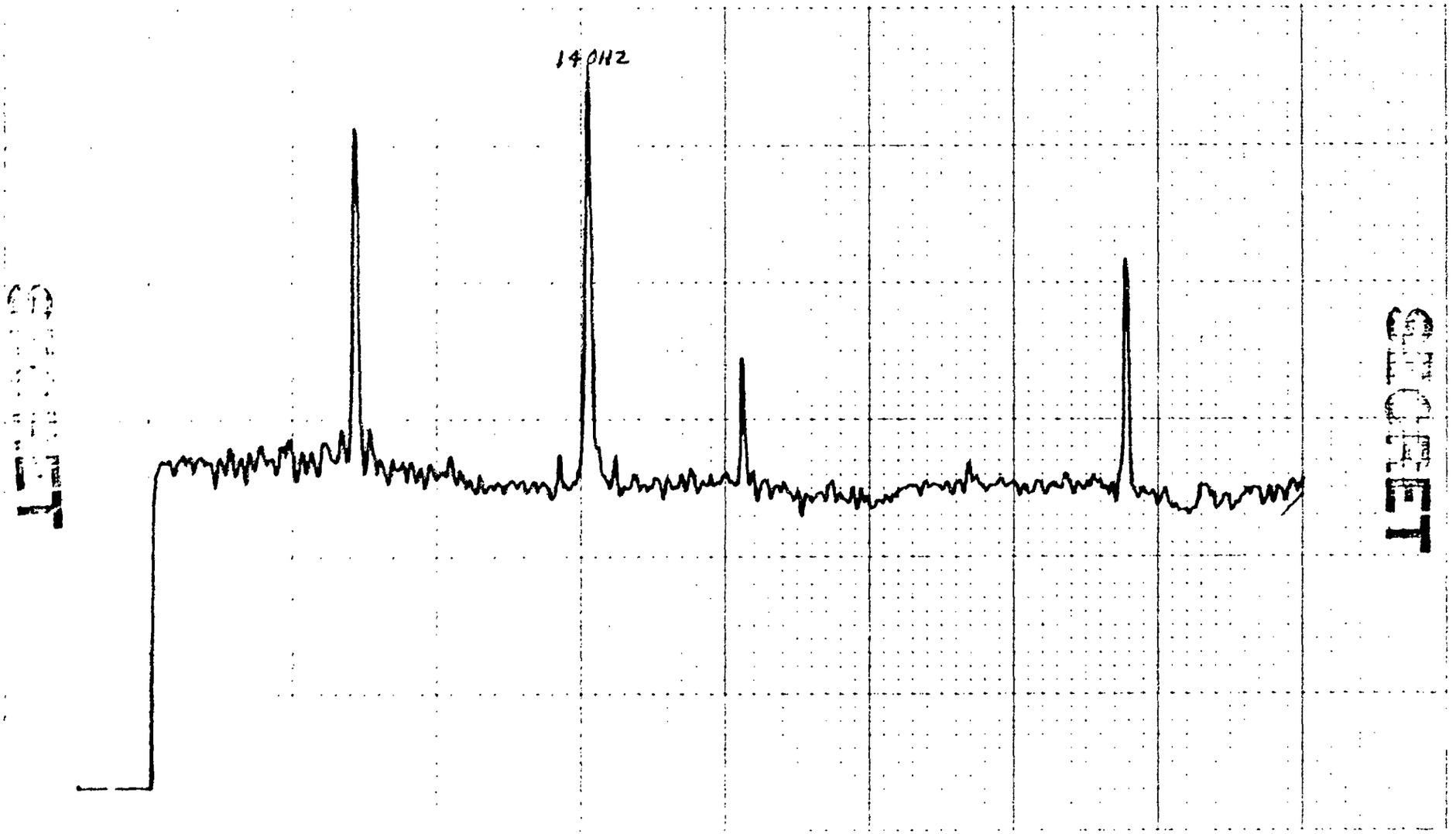
CONTROL: 3-15 - 2131 (48)
OMNI SPECTRUM(ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— — DEG AZ STEERING

REEL: H10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

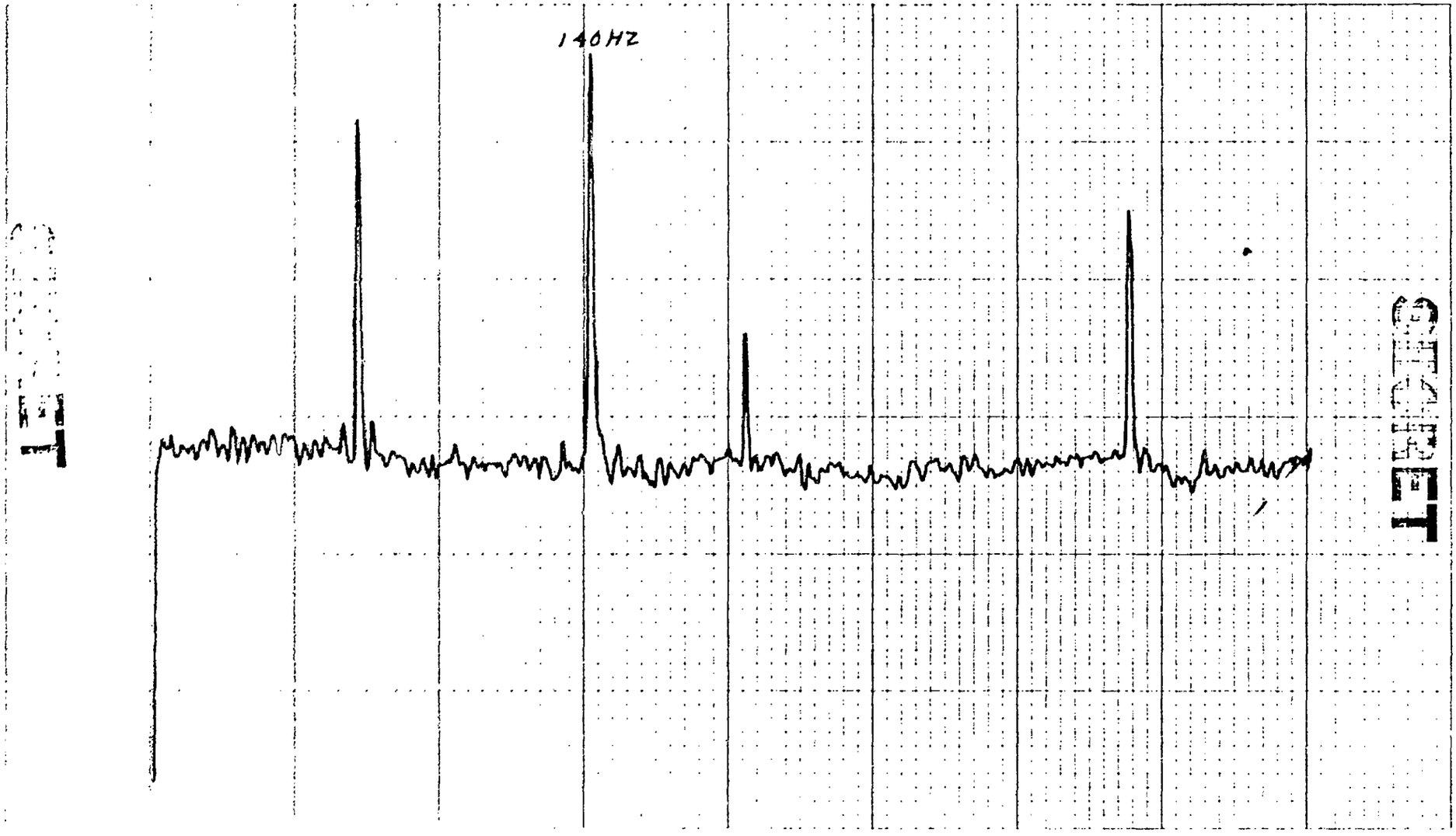
CONTROL: 3-15 - 2131 (49)
OMNI SPECTRUM(ELEMENT 47)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— — DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

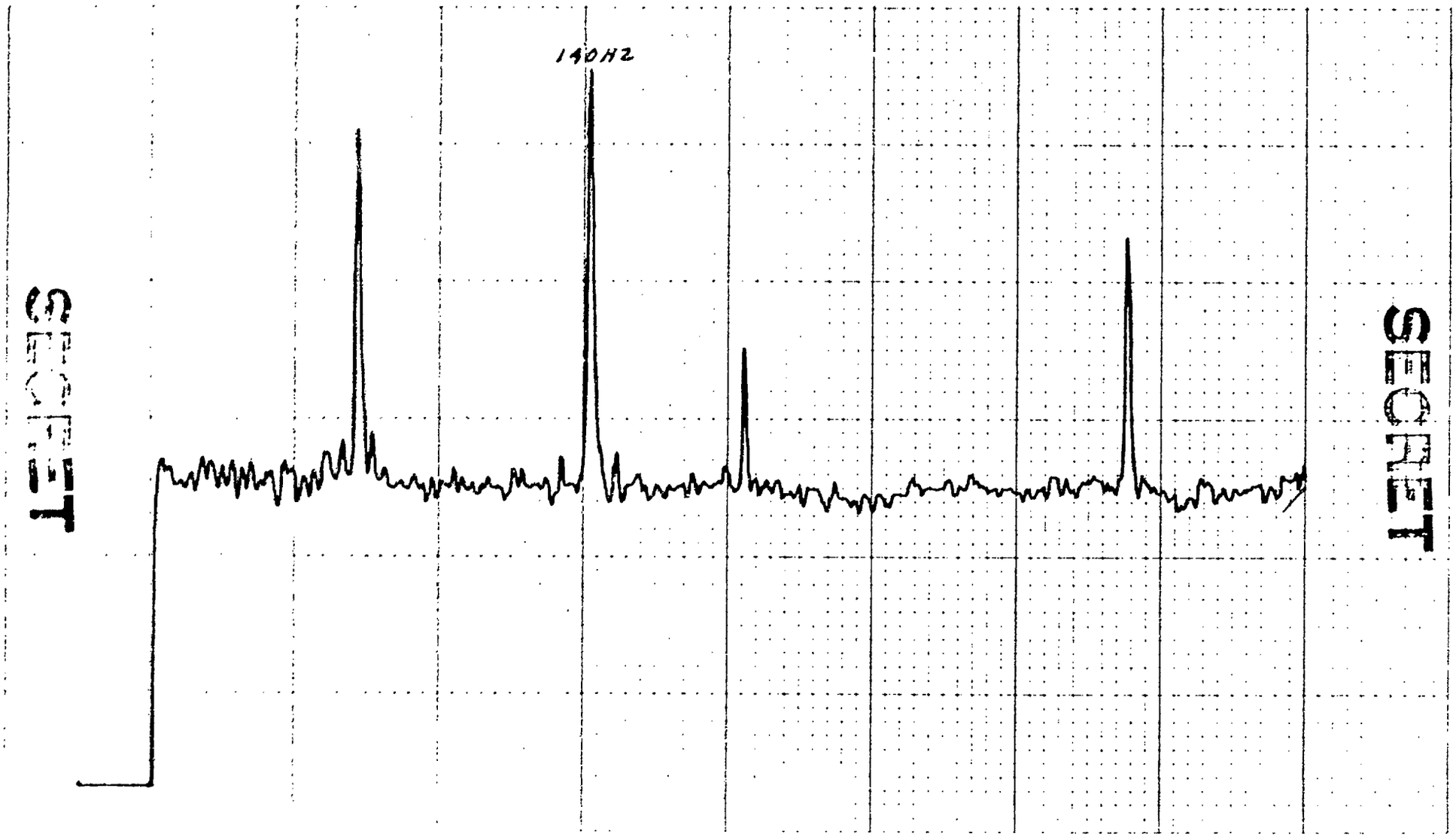
CONTROL: 3-15 - 2131 (50)
OMNI SPECTRUM(ELEMENT 49)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 7620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

CONTROL: 3-15 - 2131 (51)
OMNI SPECTRUM (ELEMENT 51)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
___ ___DEG AZ STEERING

REEL: H10

INDEX 3620

INTEGRATION TIME 320 SECS
FILTER

ATTEN: — DB
WTG: HANNING

46 0703

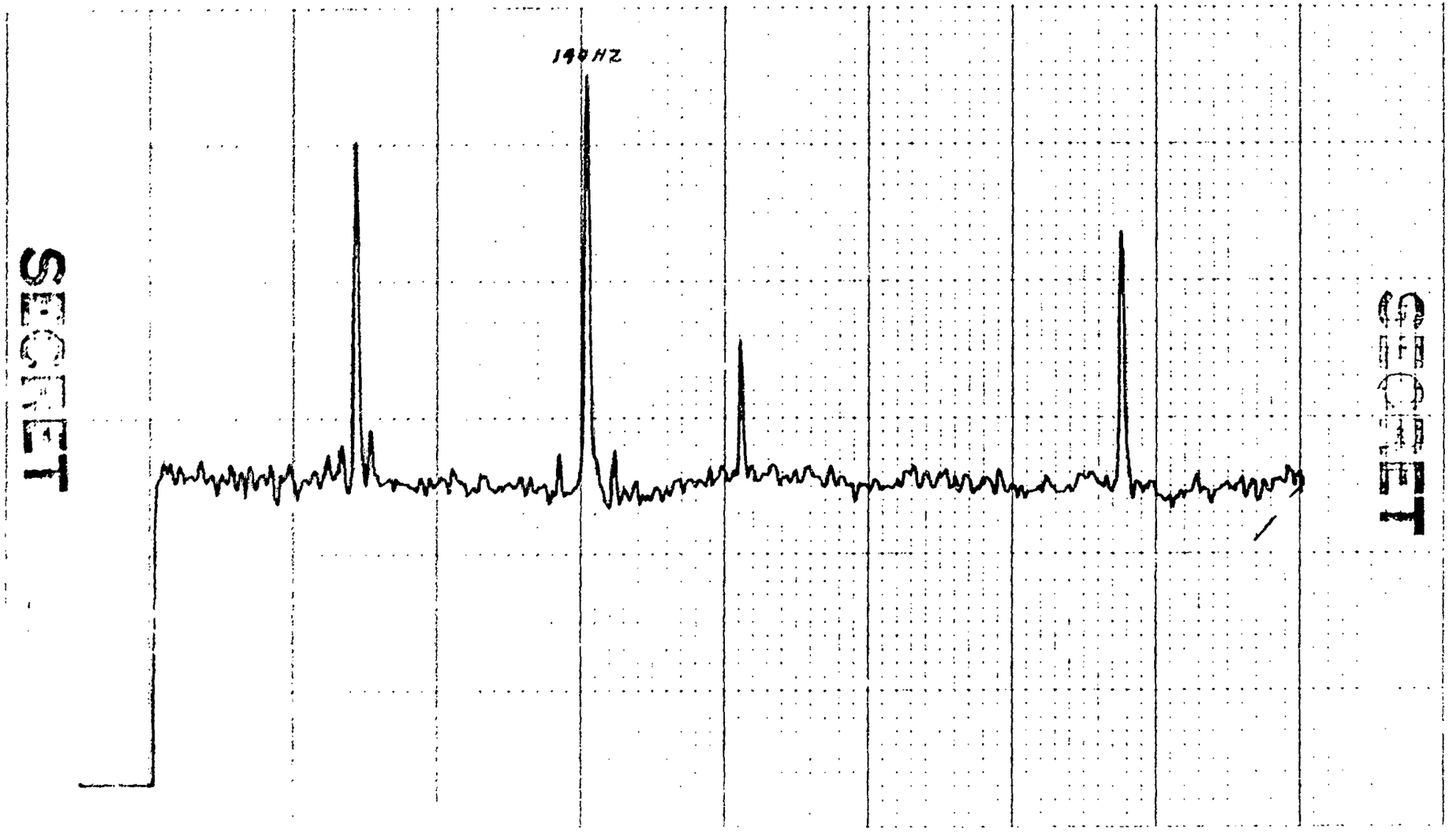
CONTROL: 3-15 - 2131 (52)
OMNI SPECTRUM(ELEMENT 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

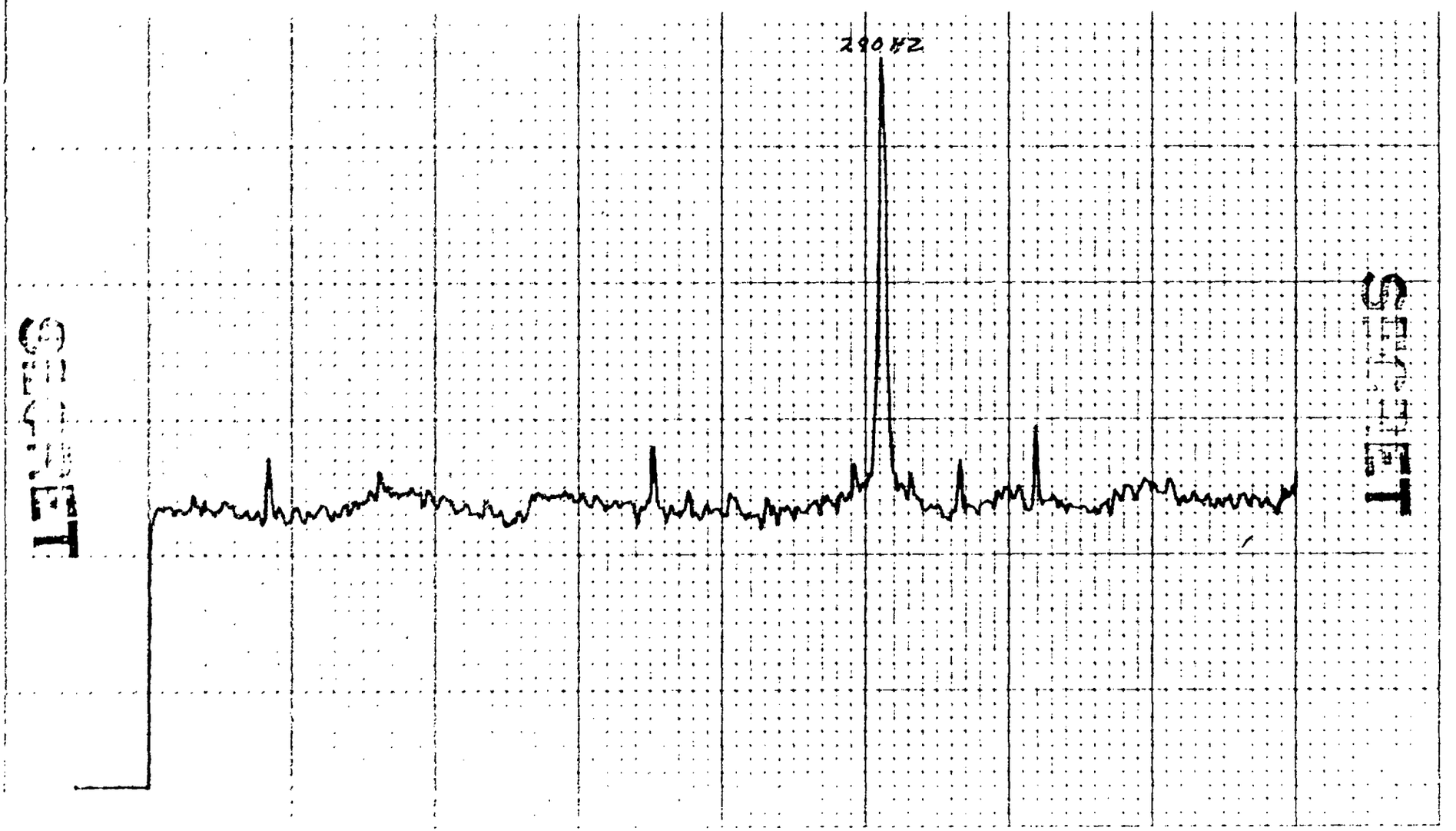
CONTROL: 3-15-2131 (53)
OMNI SPECTRUM(ELEMENT 2)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
' ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

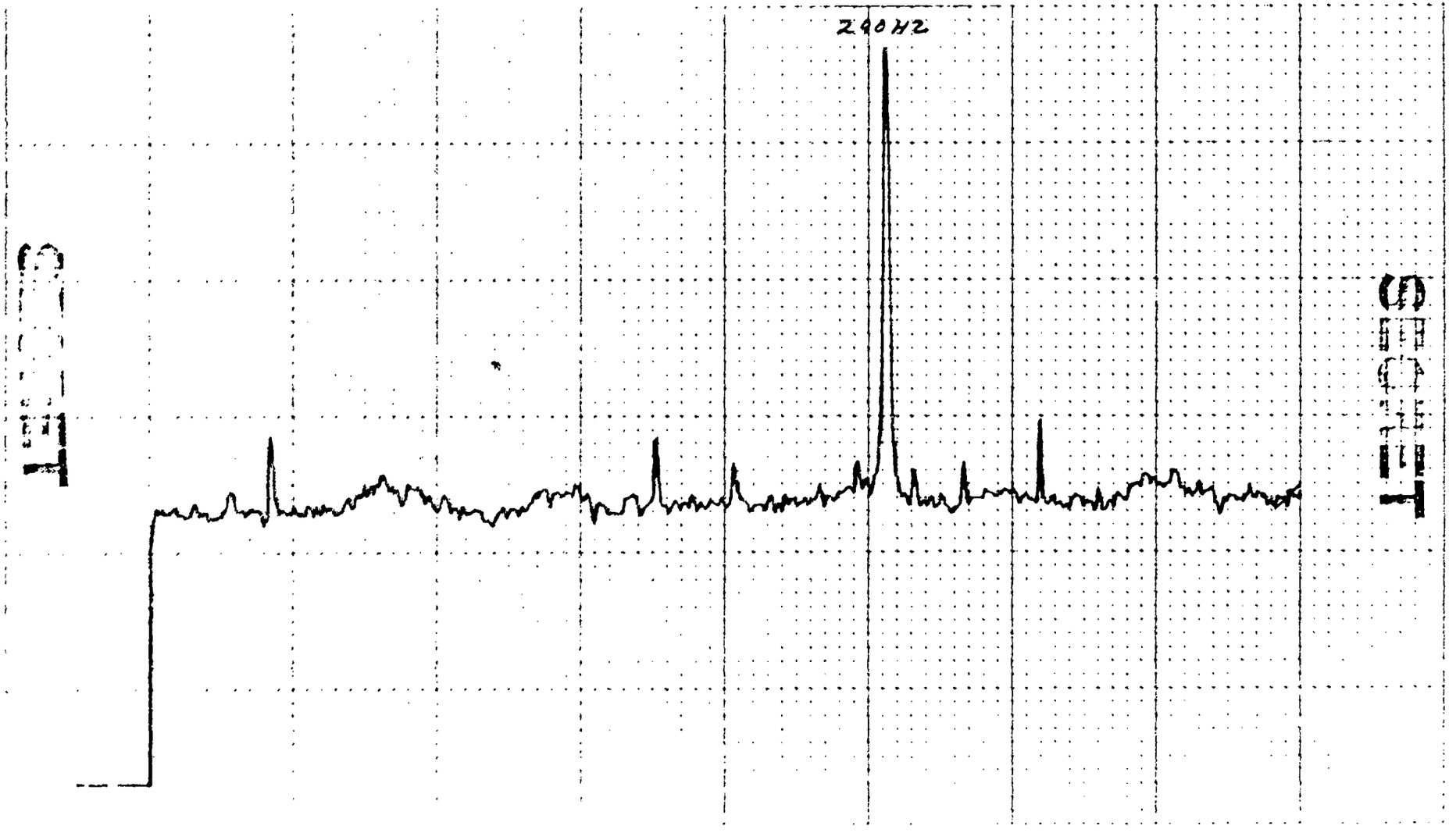
CONTROL: 3-15-2131 (54)
OMNI SPECTRUM(ELEMENT 4)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

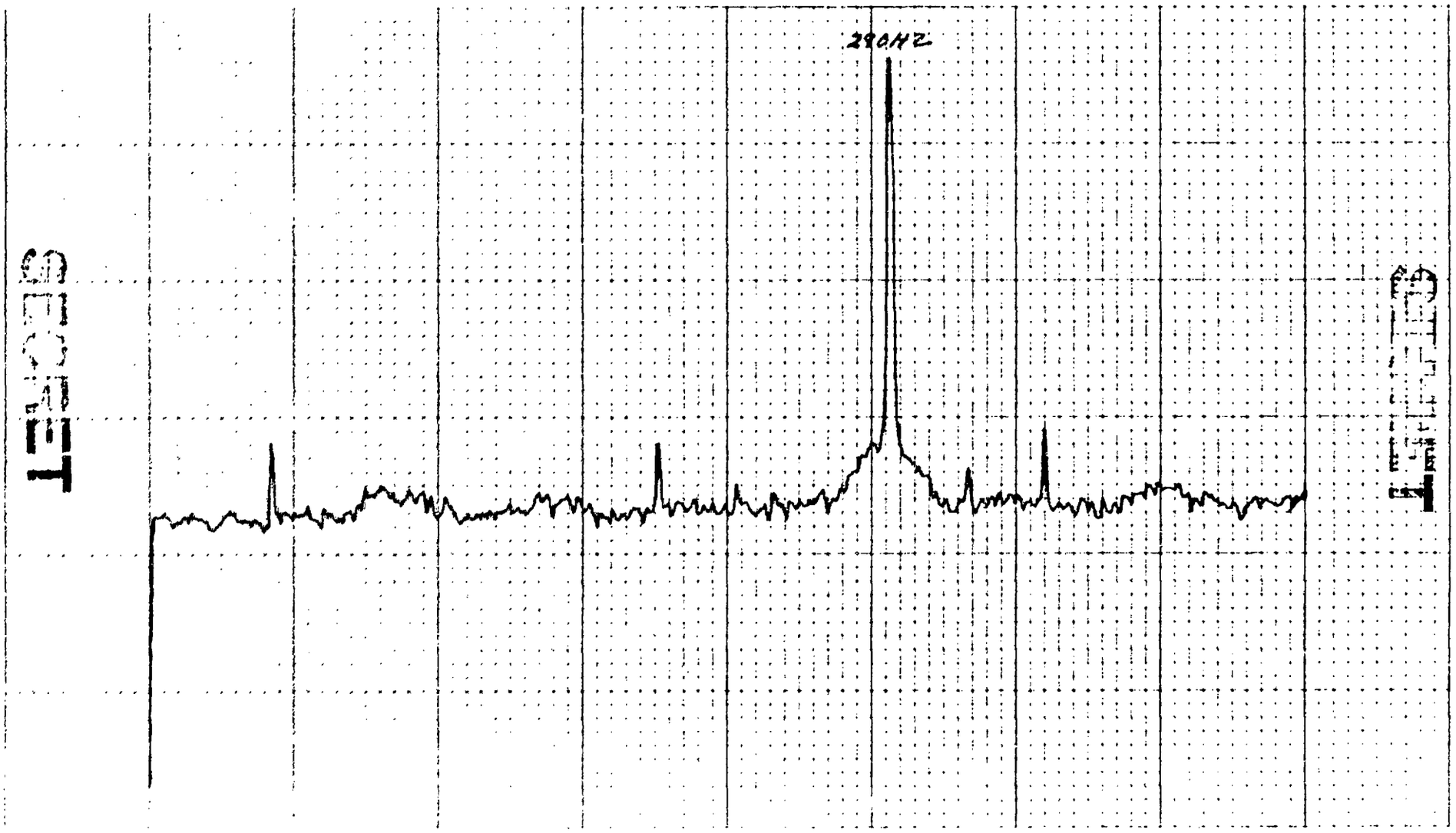
CONTROL: 3-15 - 2131 (55)
OMNI SPECTRUM(ELEMENT 6)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 362

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

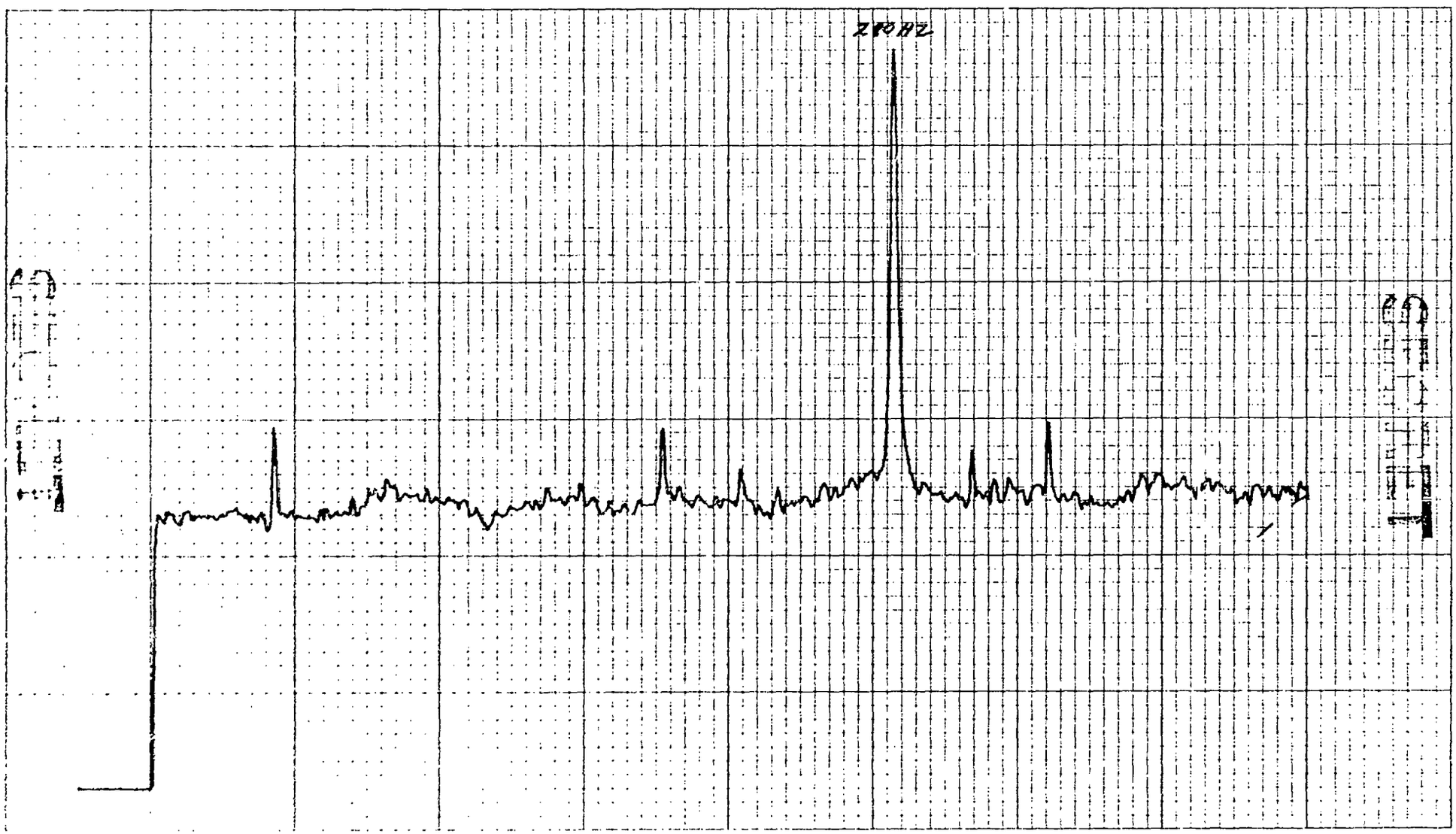
CONTROL: 3-15-2131 (56)
OMNI SPECTRUM(ELEMENT 9)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

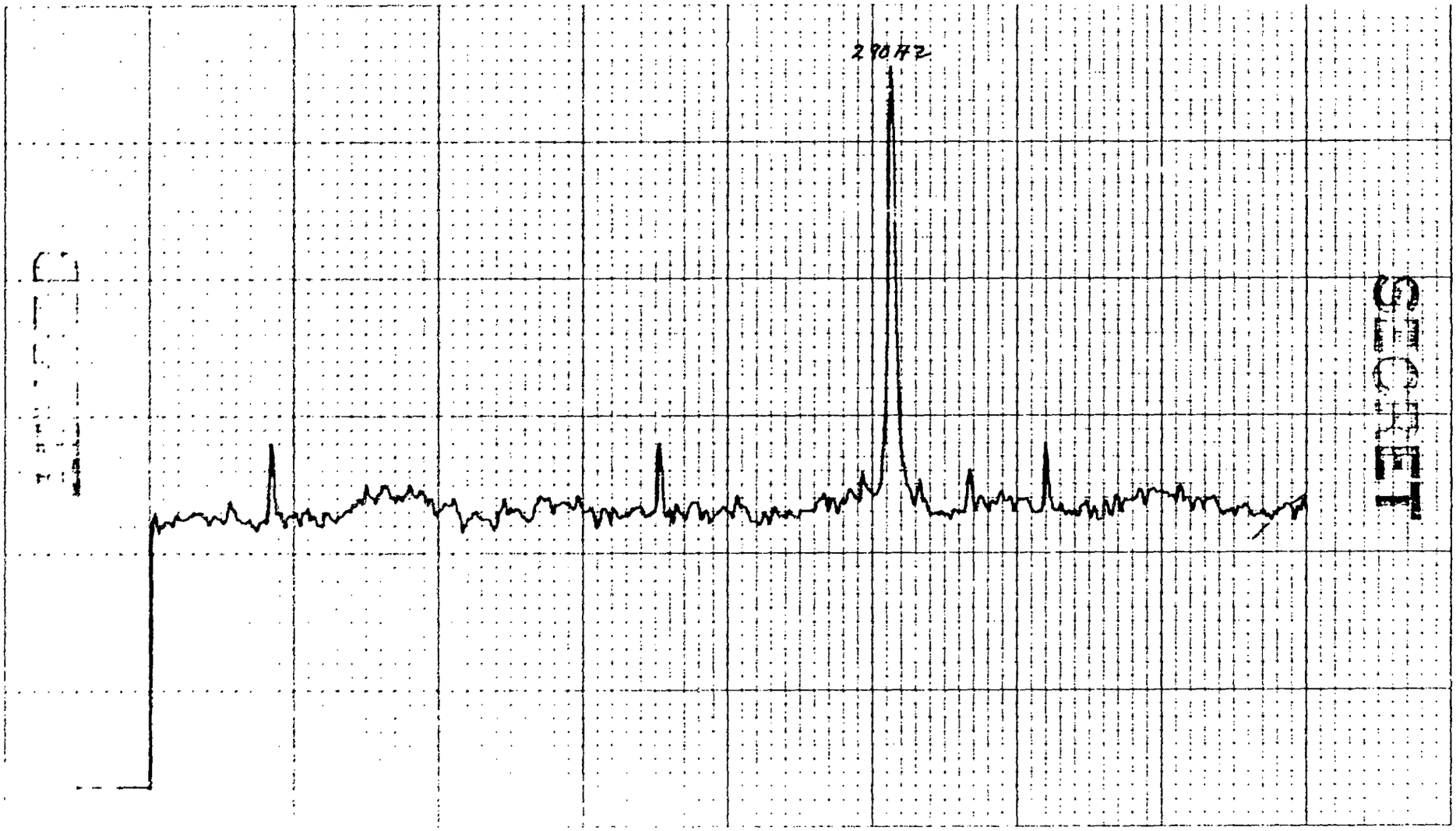
CONTROL: 3-15 - 2131 (57)
OMNI SPECTRUM(ELEMENT 10)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



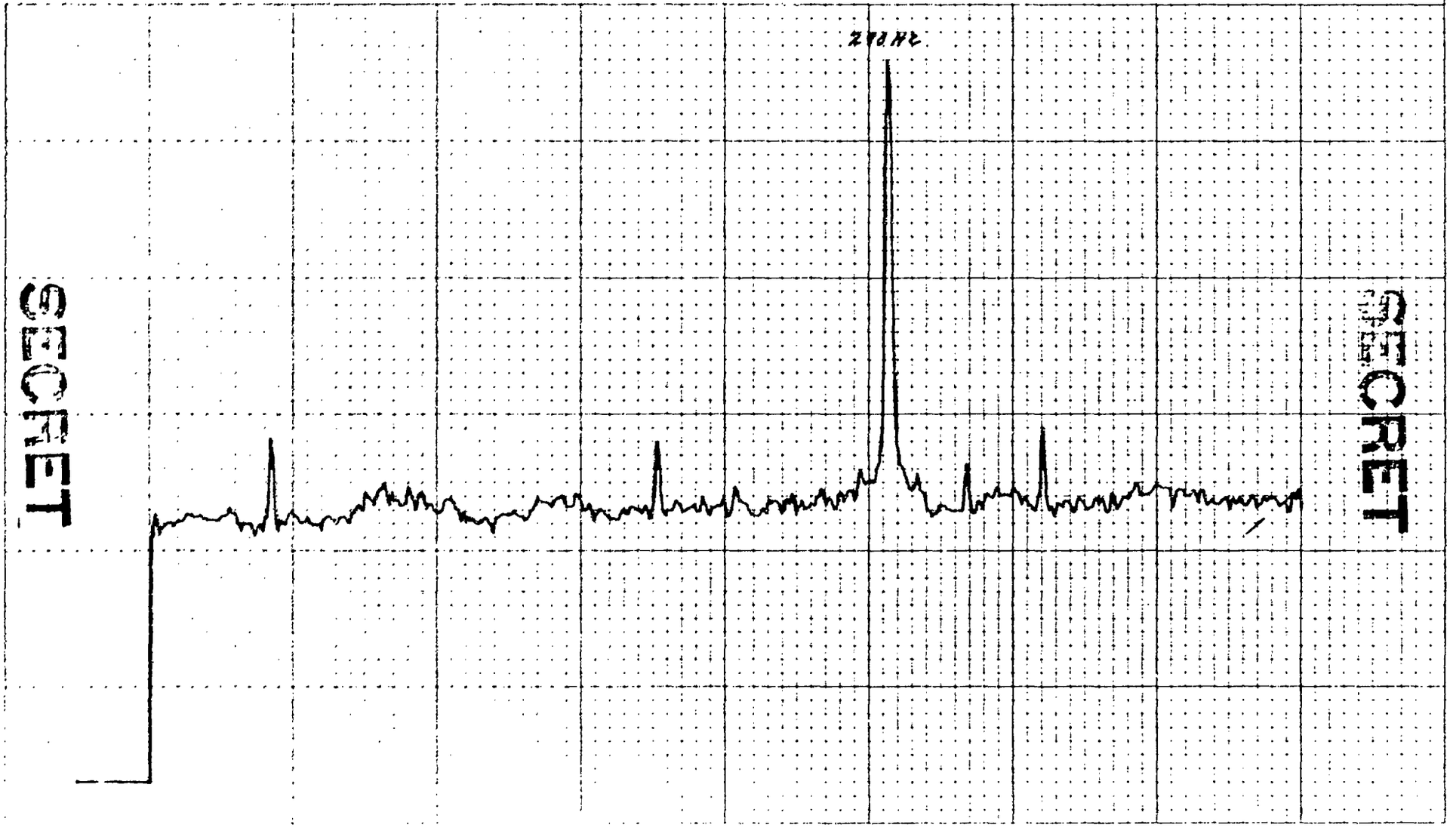
CONTROL: 345 - 2131 (58)
OMNI SPECTRUM(ELEMENT 12)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3690

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



46 0703

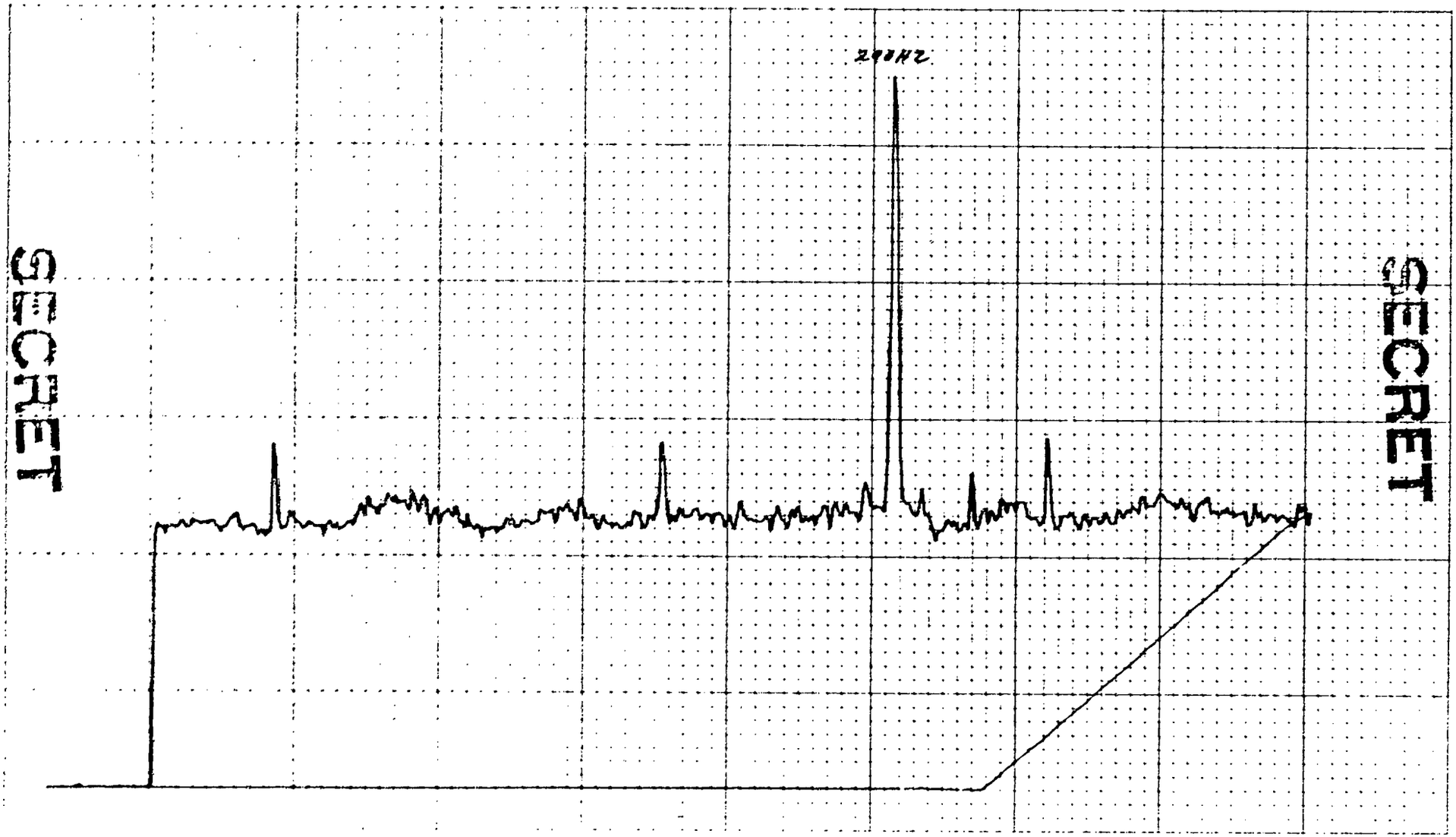
CONTROL: 3-15-2131 (59)
OMNI SPECTRUM (ELEMENT 14)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: H10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



46 0703

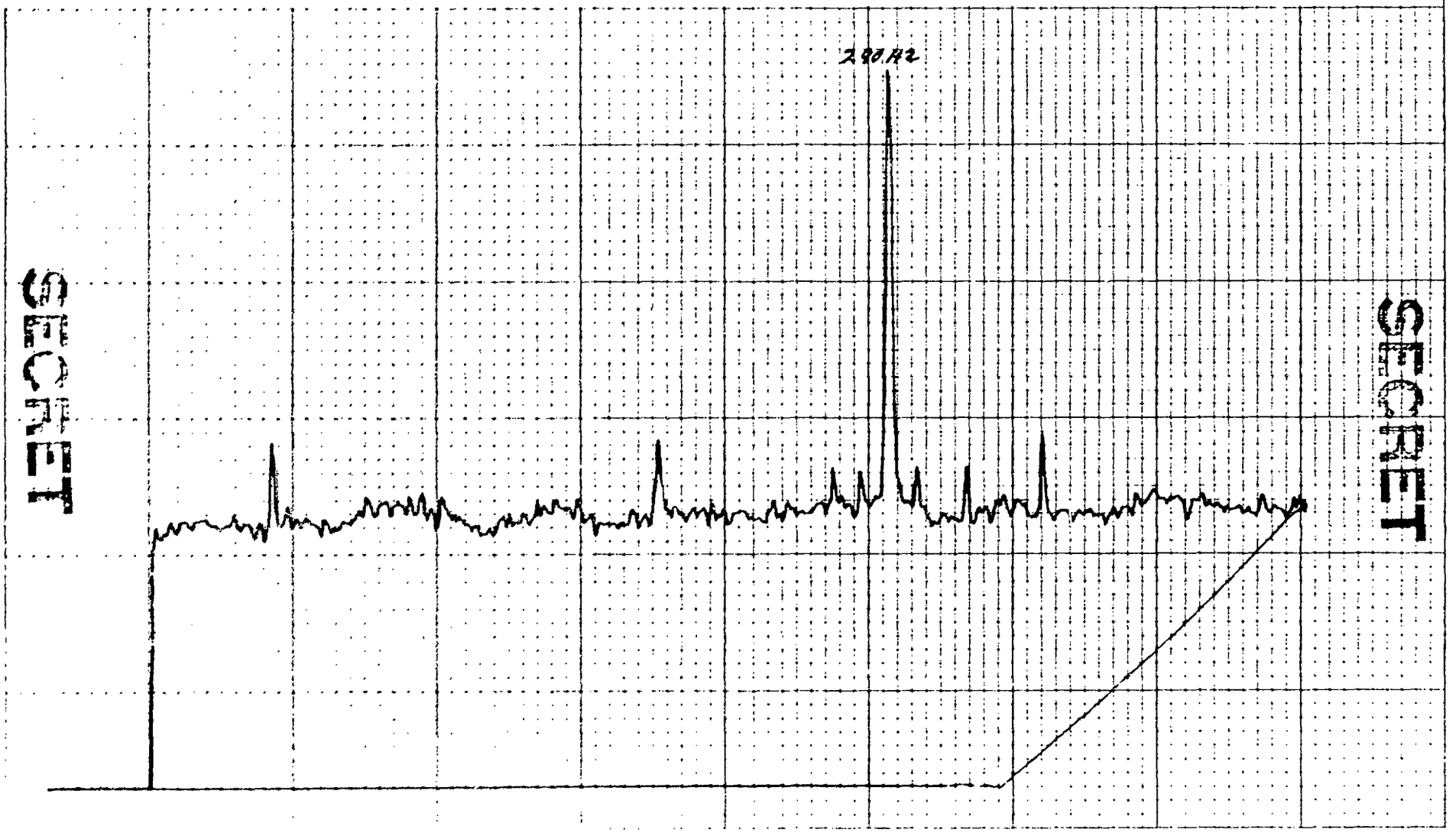
CONTROL: 3-15-2131 (60)
OMNI SPECTRUM(ELEMENT 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



CONTROL: 3-15-2131 (61)
OMNI SPECTRUM (ELEMENT 19)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 7-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

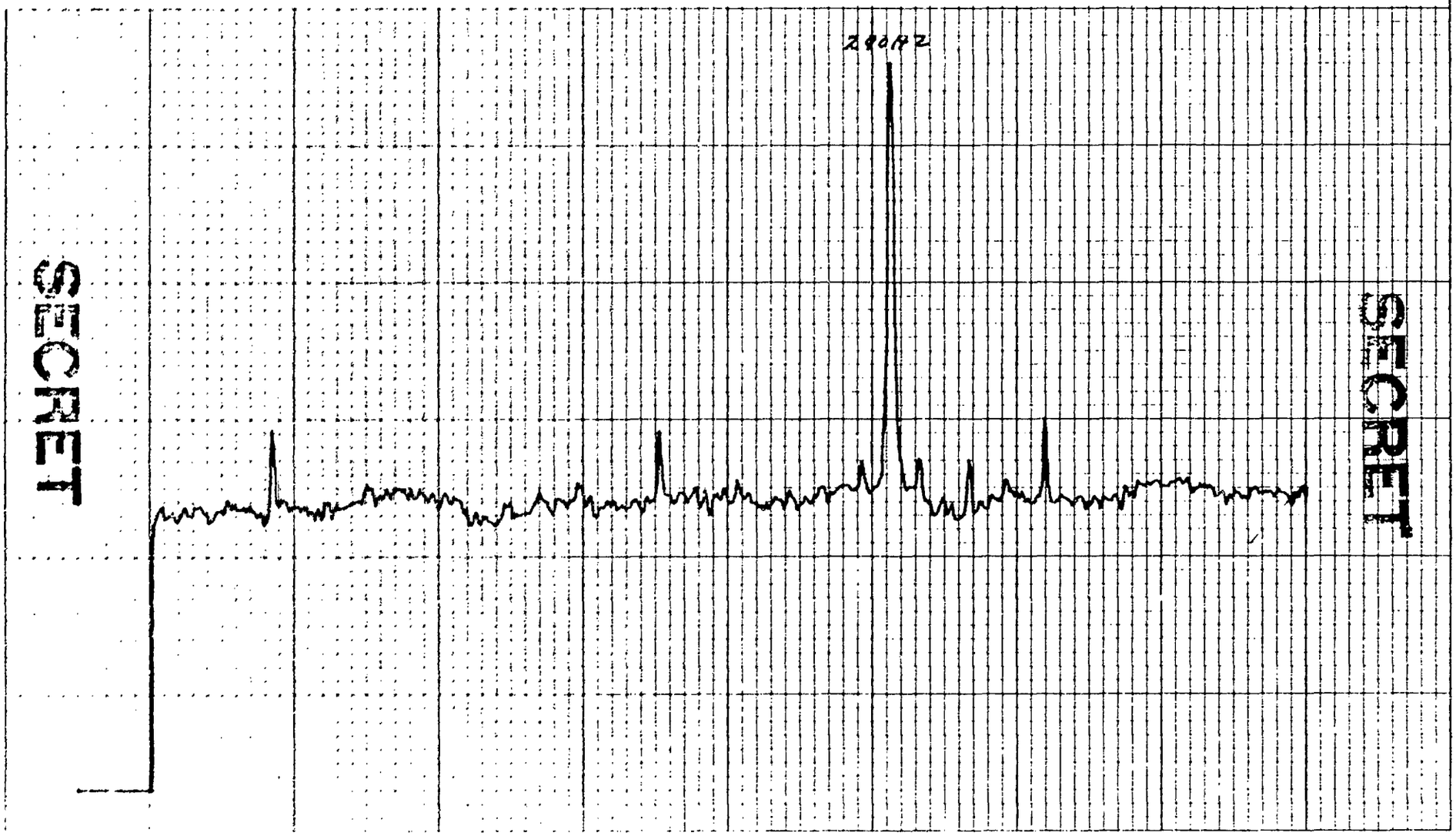
CONTROL: 3-15-2131 (62)
OMNI SPECTRUM (ELEMENT 30)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77-2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 362C

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

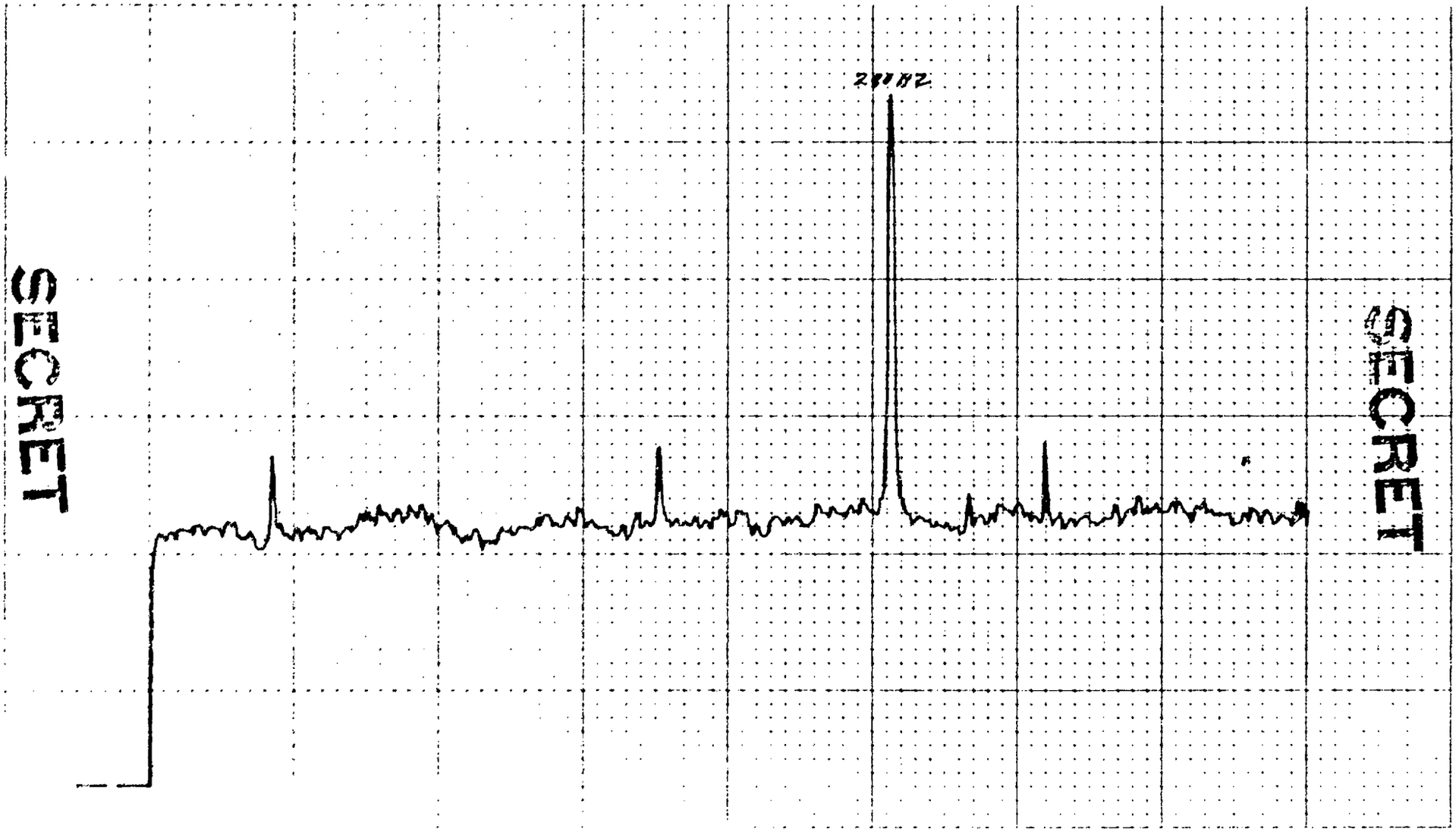
CONTROL: 3-15 - 2131 (63)
OMNI SPECTRUM (ELEMENT 23)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 362C

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

SECRET

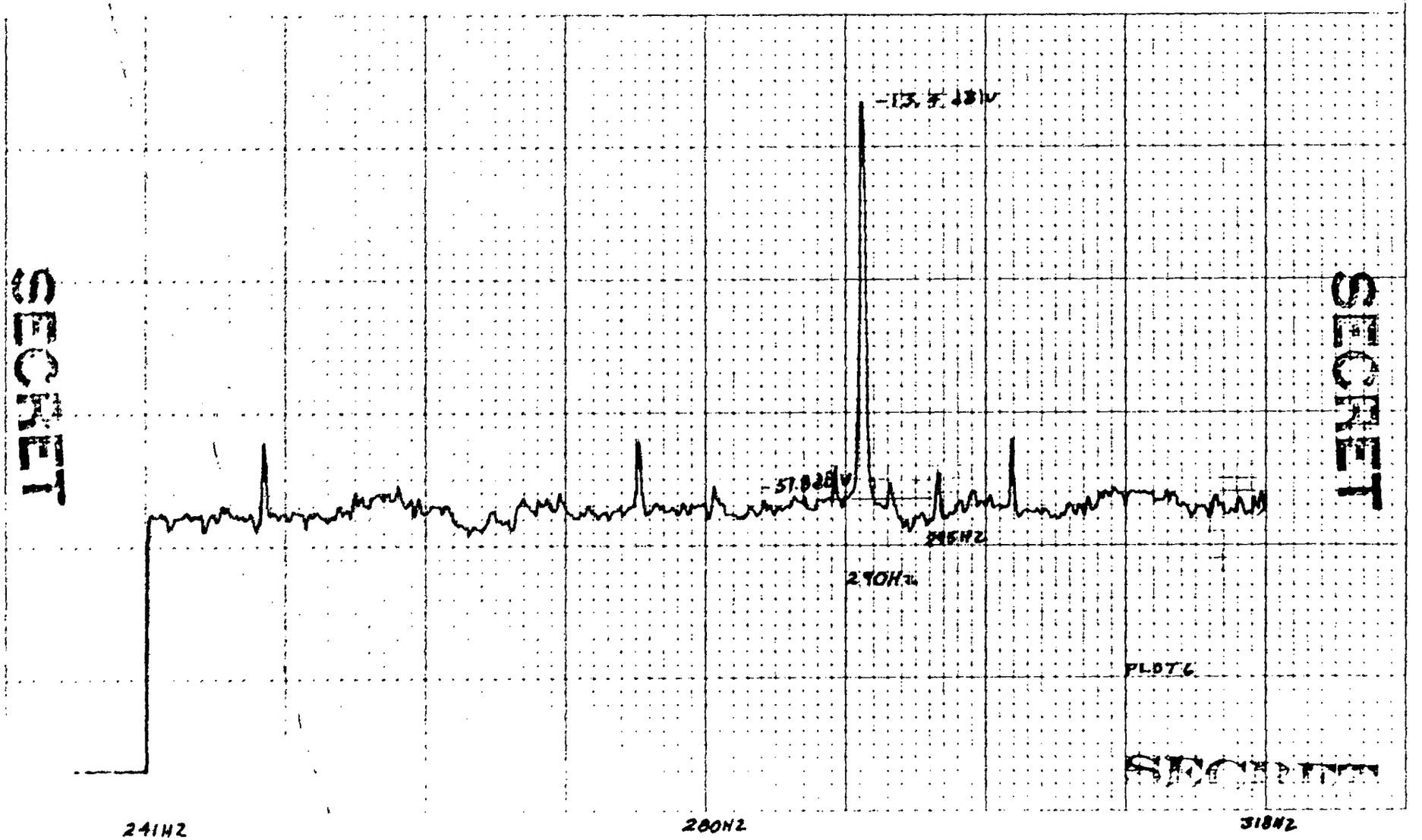
CONTROL: 2131 - 51 (DP9)
OMNI SPECTRUM (ELEMENT 24)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
- DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

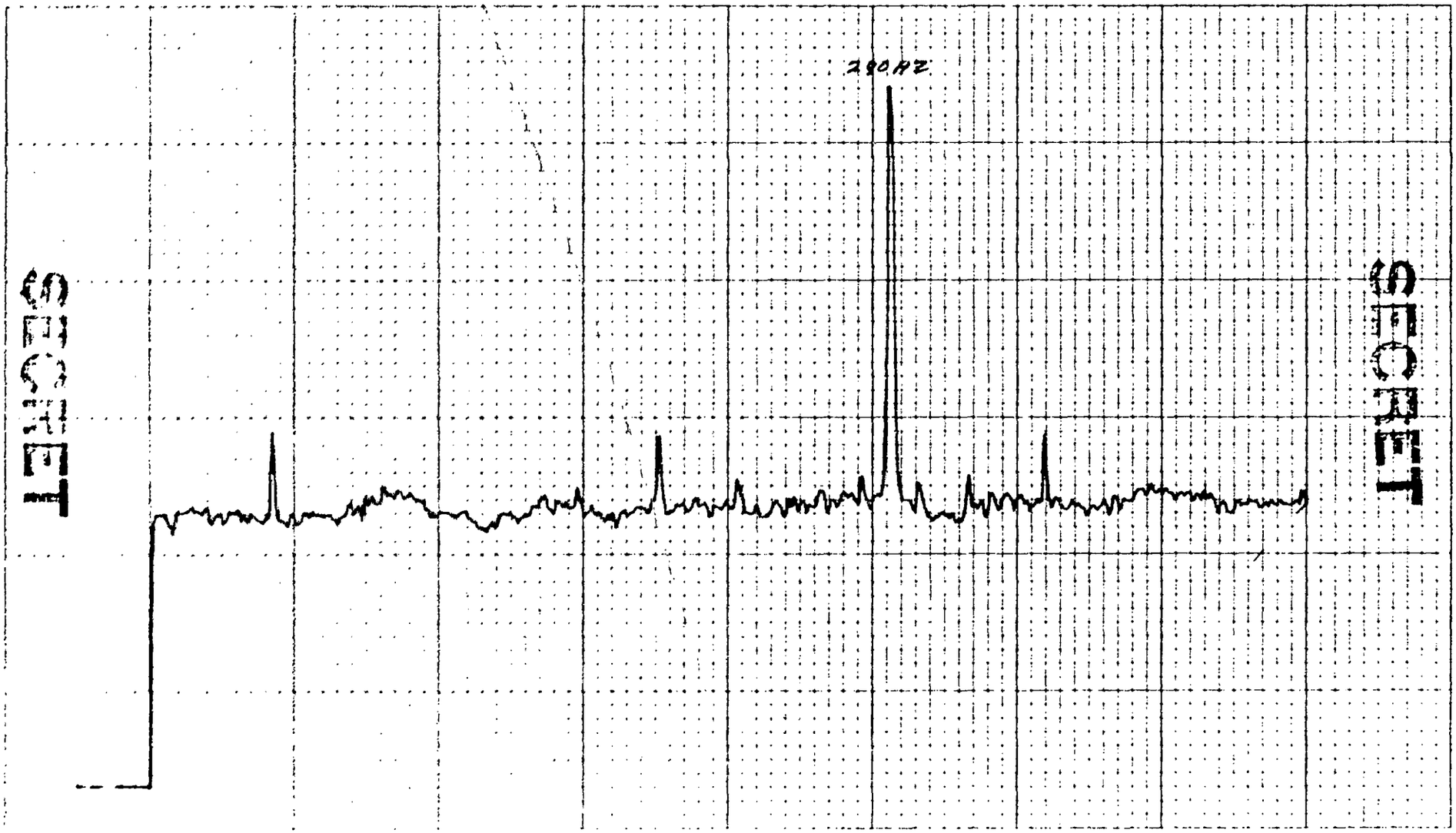
CONTROL: 3-15 - 2131 (65)
OMNI SPECTRUM (ELEMENT 26)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

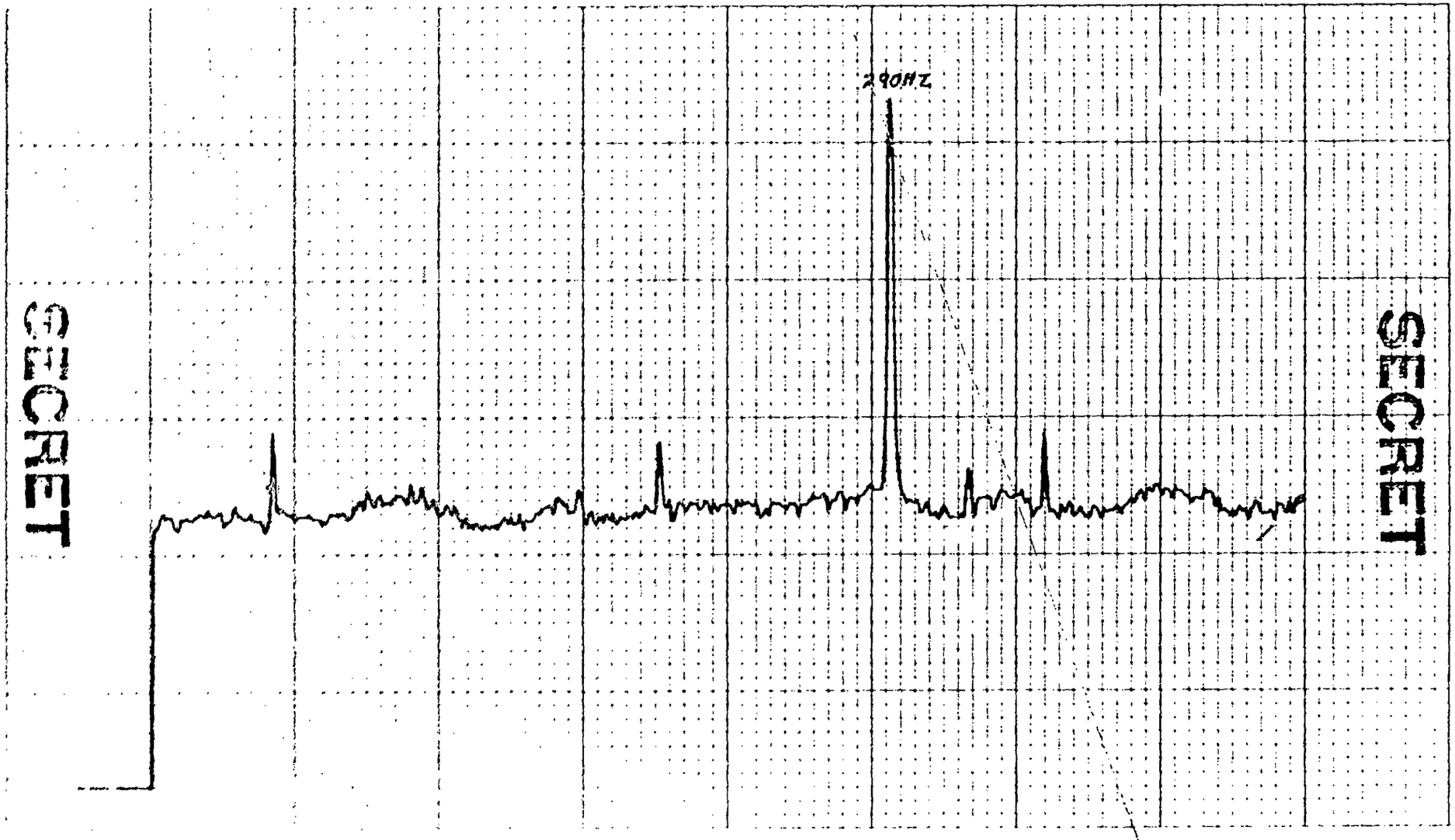
CONTROL: 2131 - 51 (UPP)
OMNI SPECTRUM (ELEMENT 29)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-16-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
- DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



46 0703

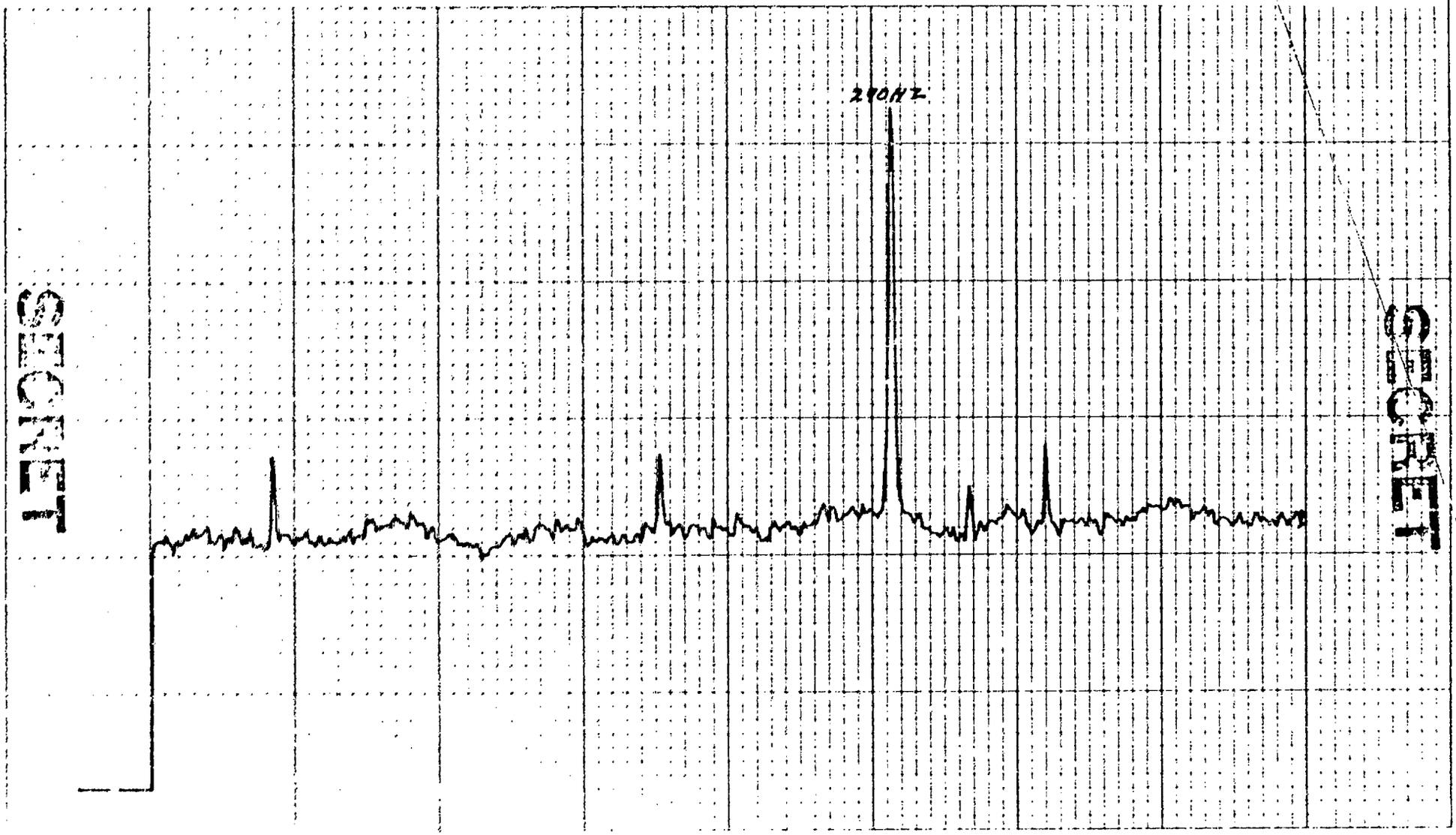
CONTROL: 3-15 -2131 (67)
OMNI SPECTRUM(ELEMENT 31)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: H10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

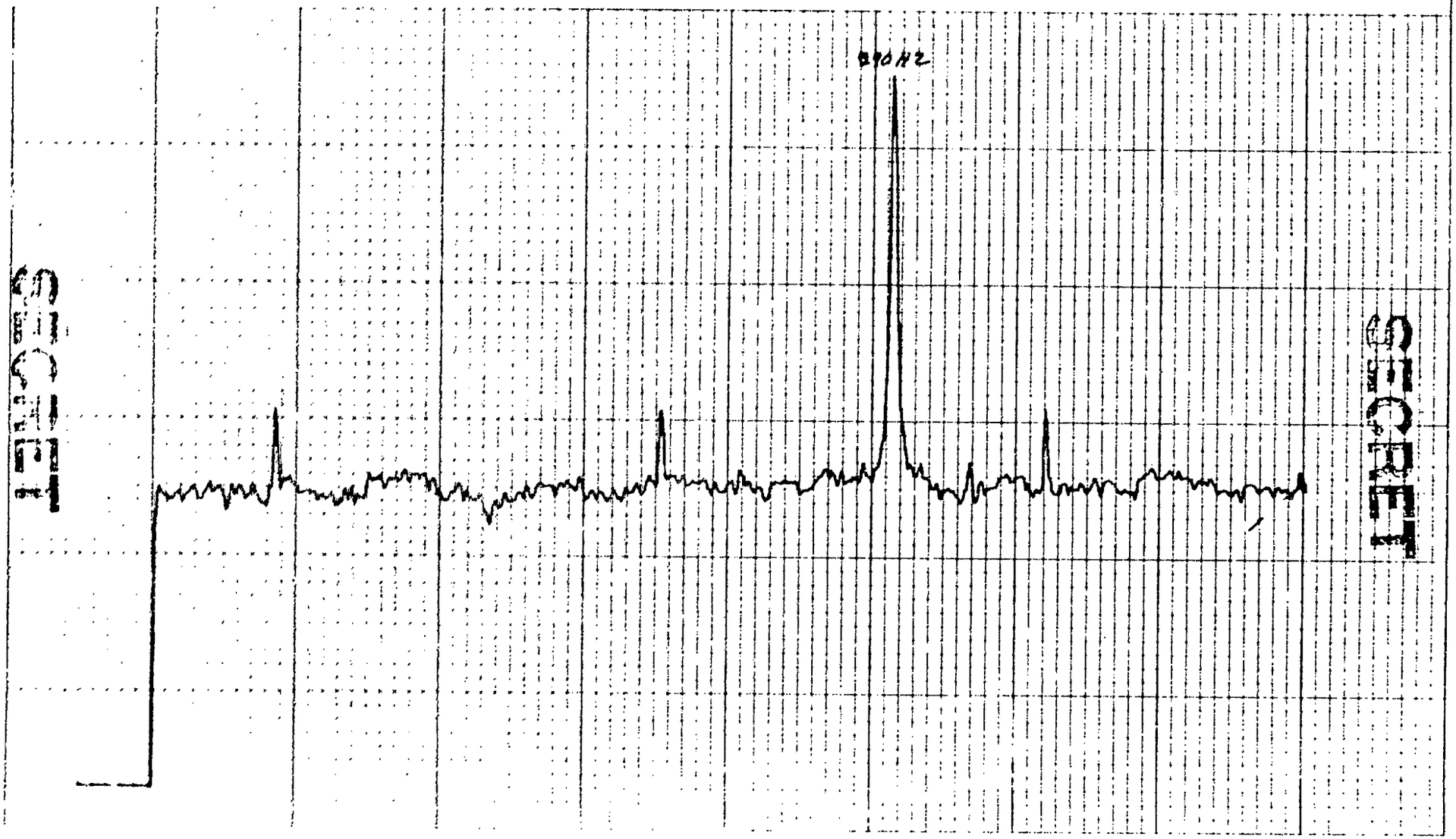
CONTROL: 3-15 - 2131 (68)
OMNI SPECTRUM(ELEMENT 33)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 362c

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



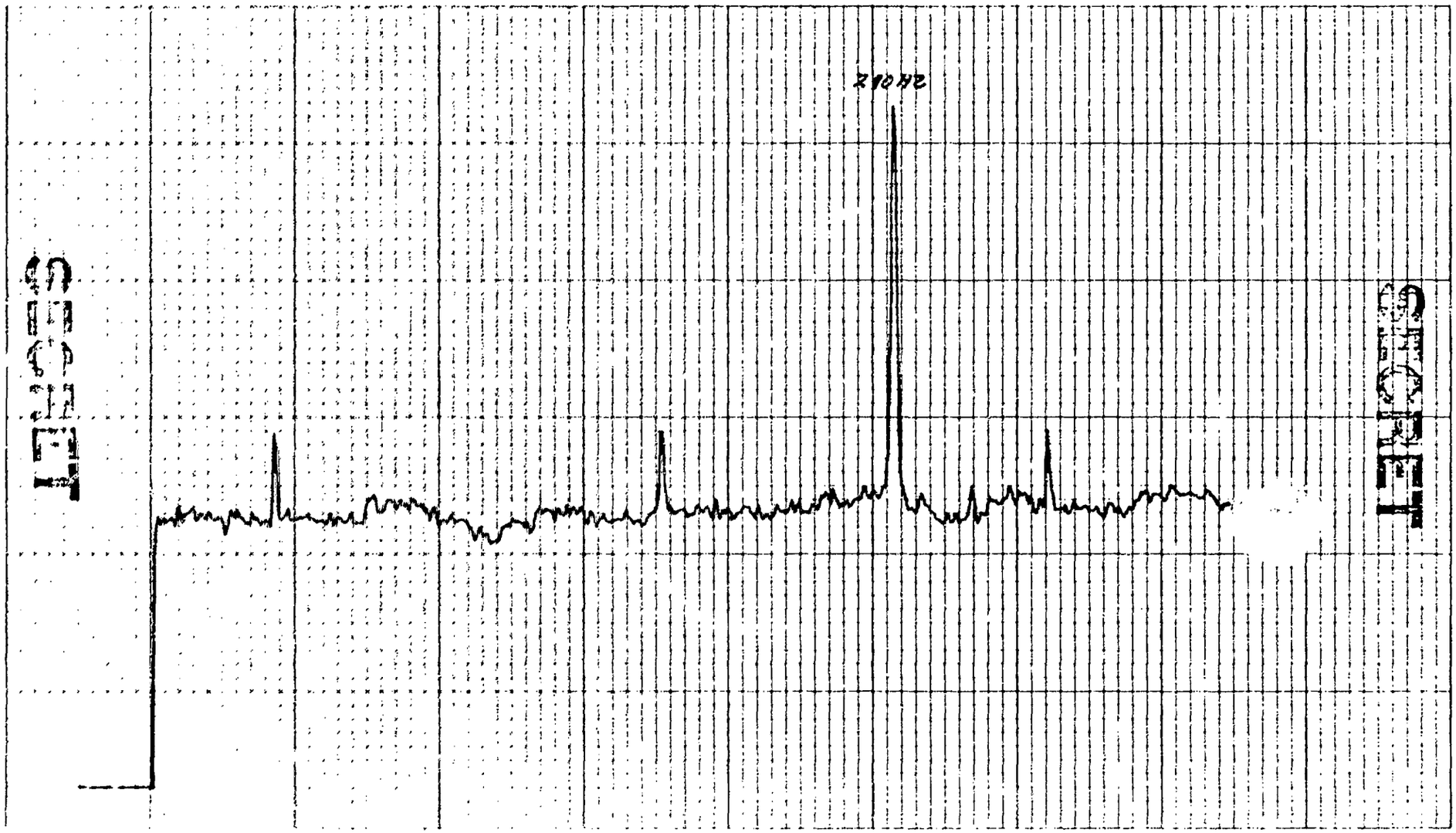
CONTROL: 3-15-2131Z(69)
OMNI SPECTRUM(ELEMENT 35)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77-2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: N10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



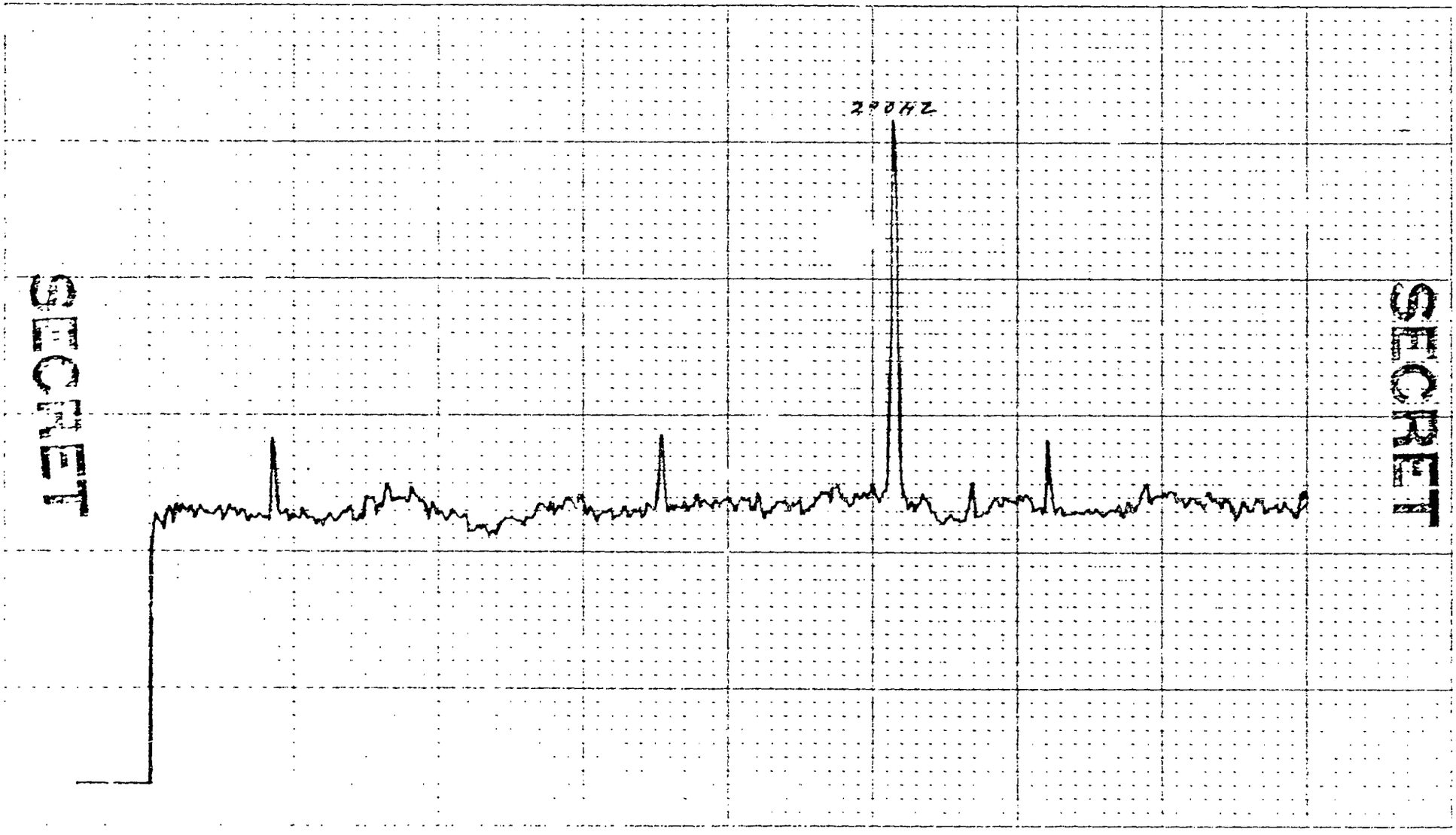
CONTROL: 345-2131 (70)
OMNI SPECTRUM(ELEMENT 37)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-1577 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

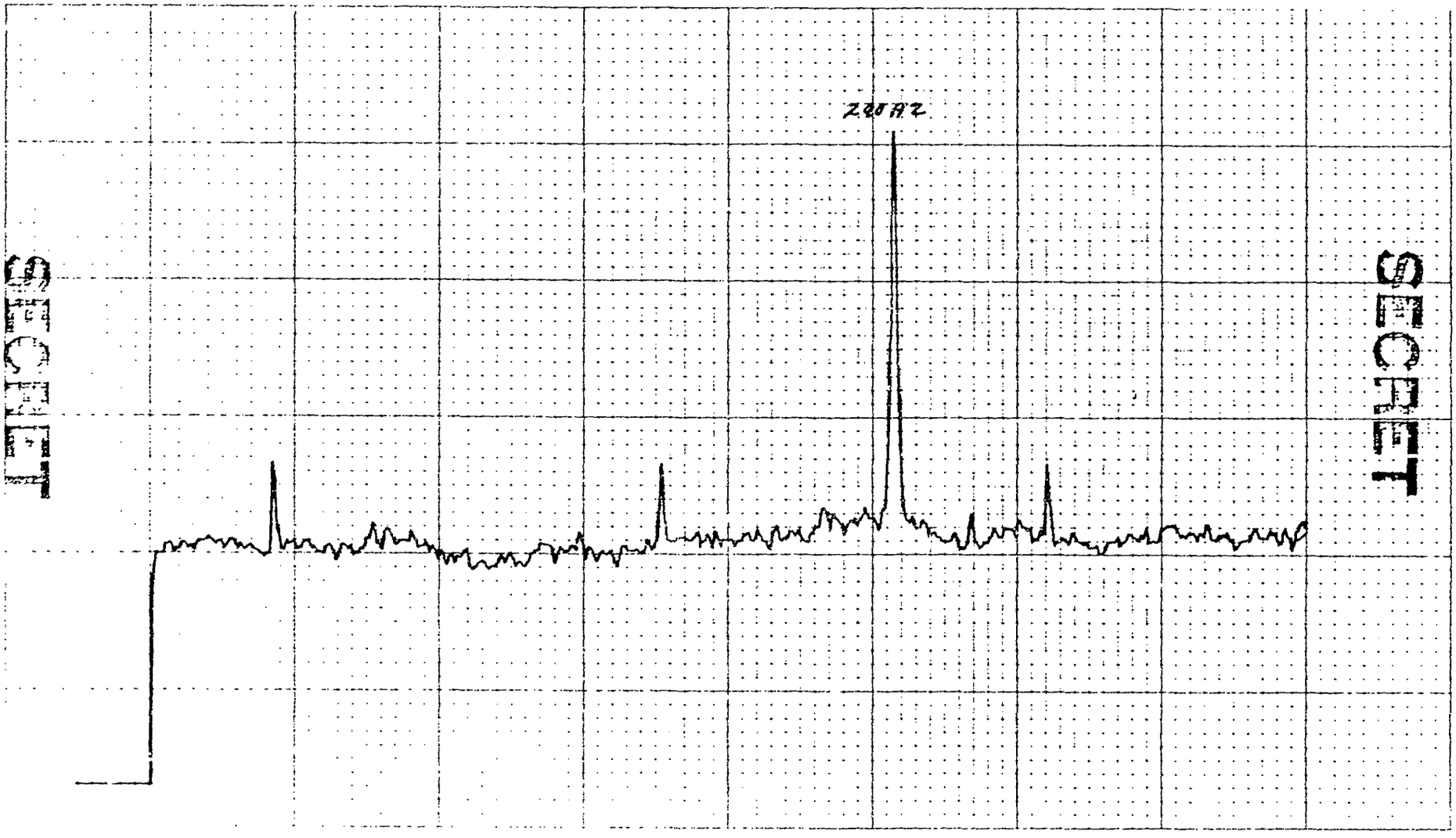
CONTROL: 3-15-2131 (71)
OMNI SPECTRUM(ELEMENT 39)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 -2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

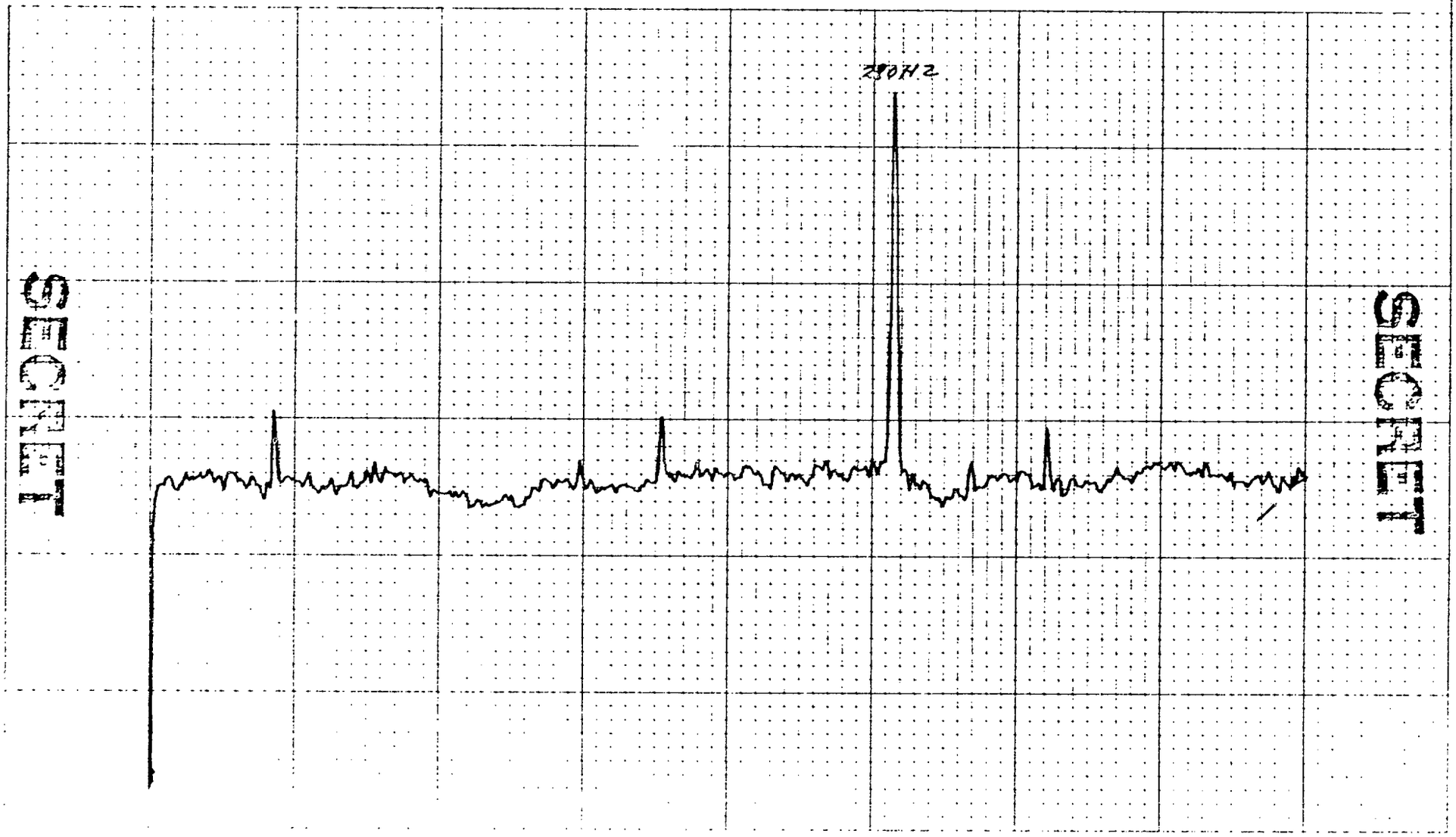
CONTROL: 3-15-2131 (72)
OMNI SPECTRUM(ELEMENT 41)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 345-2131 (73)
OMNI SPECTRUM (ELEMENT 43)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 345-77 -2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: H10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

#14

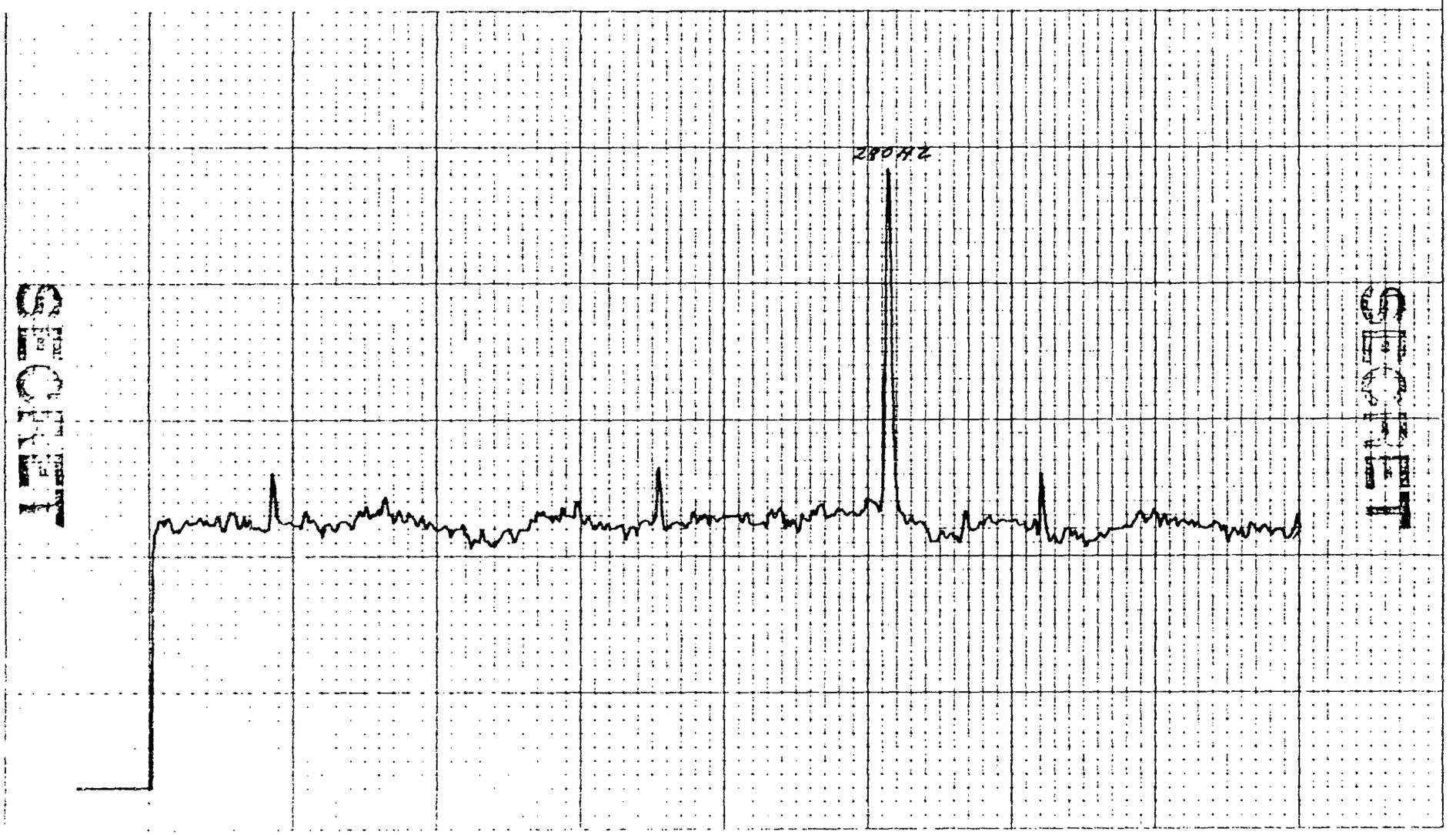
CONTROL: 3-15 - 2131 (74)
OMNI SPECTRUM(ELEMENT 45)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEC AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

CONTROL: 345 - 2131 (75)
OMNI SPECTRUM(ELEMENT 47)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

CONTROL: 3-15 -2131 (7C)
OMNI SPECTRUM(ELEMENT 49)
EXERCISE:BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: M10 INDEX 3670

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING

46 0703

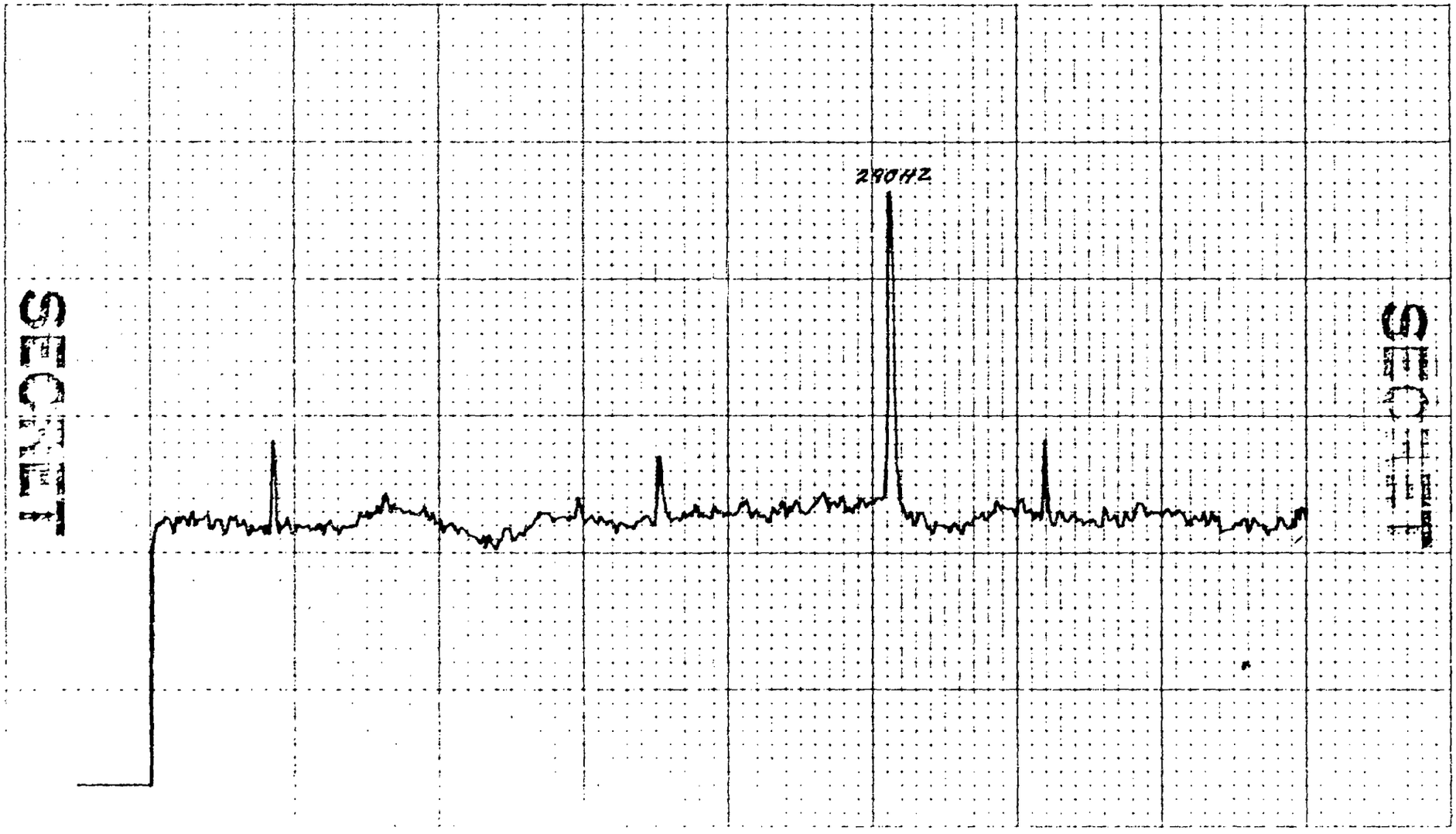
CONTROL: 315-2131 (77)
OMNI SPECTRUM(ELEMENT 51)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

DATE OF ANALYSIS:

DATE/TIME: 315-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: N10 INDEX 362c

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING



46 0703

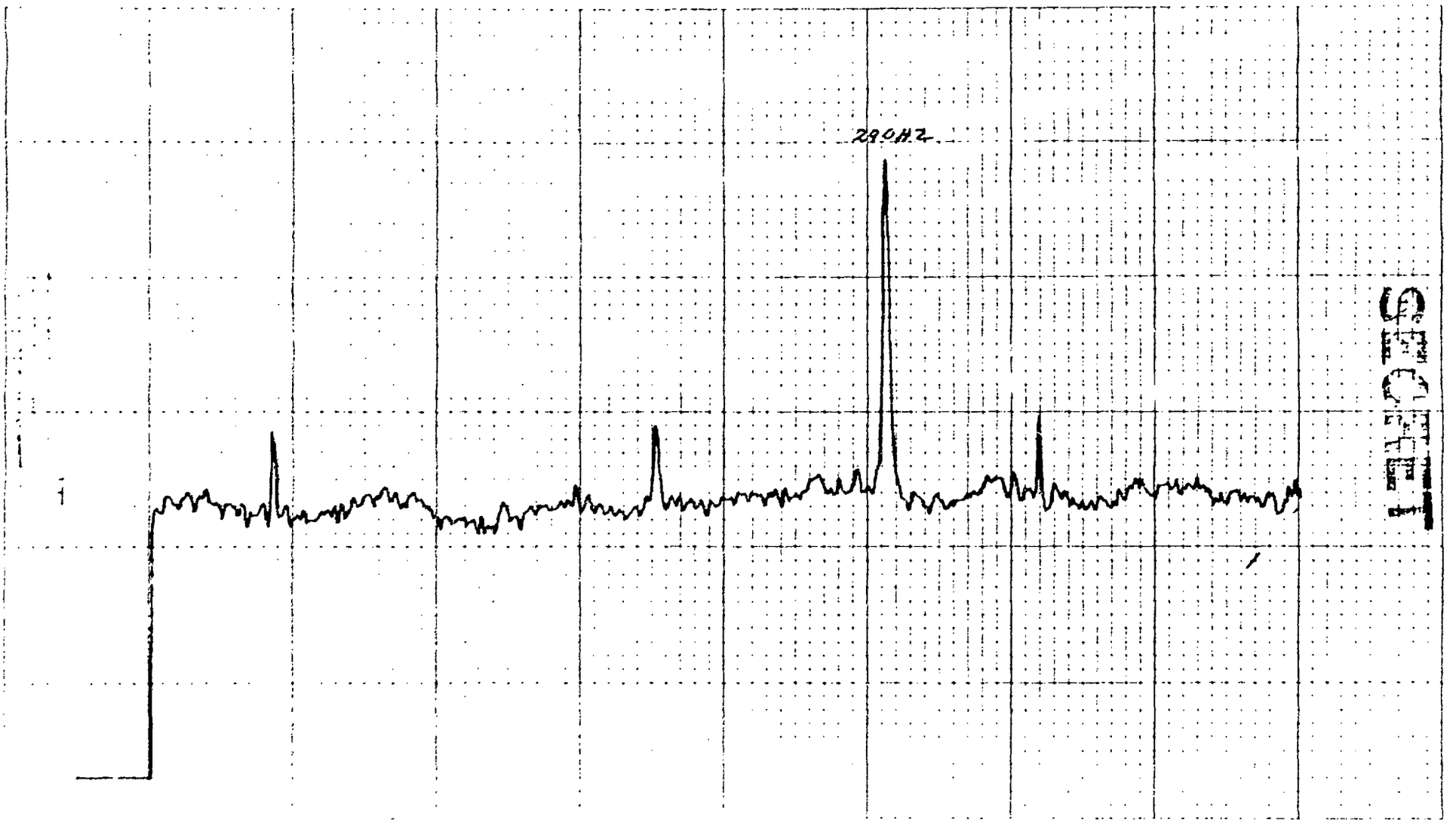
CONTROL: 3-15 - 2131 (78)
OMNI SPECTRUM(ELEMENT 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 280 HZ
1 ELEMENT

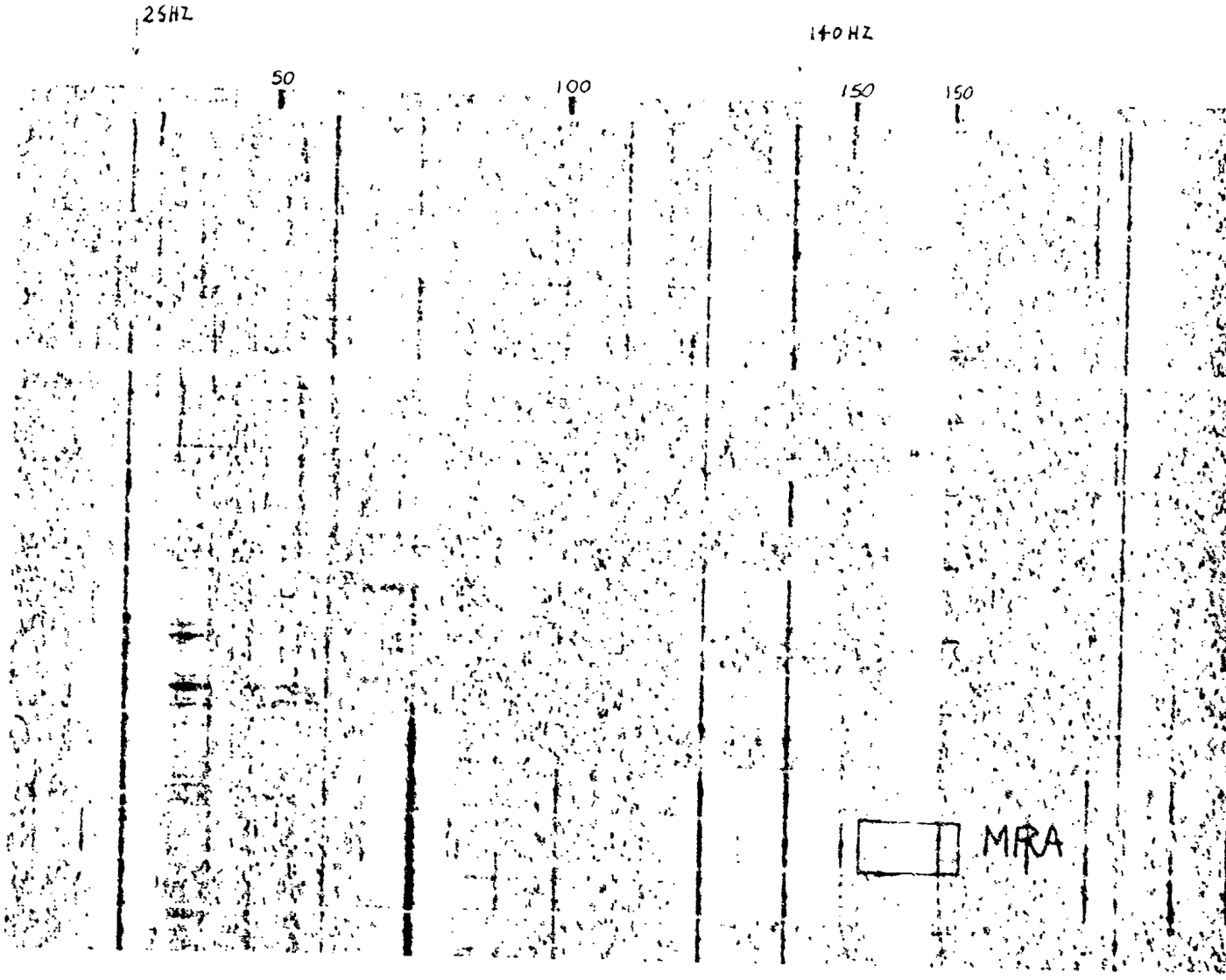
DATE OF ANALYSIS:

DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
— DEG AZ STEERING

REEL: N10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: — DB
FILTER WTG: HANNING





CONTROL NUMBER _____

NUMBER OF ELEMENTS _____

FREQUENCY BAND _____ TO _____ HZ

RANGE _____ N.M.

H I S T O G R A M

TAPE REEL NUMBER A1

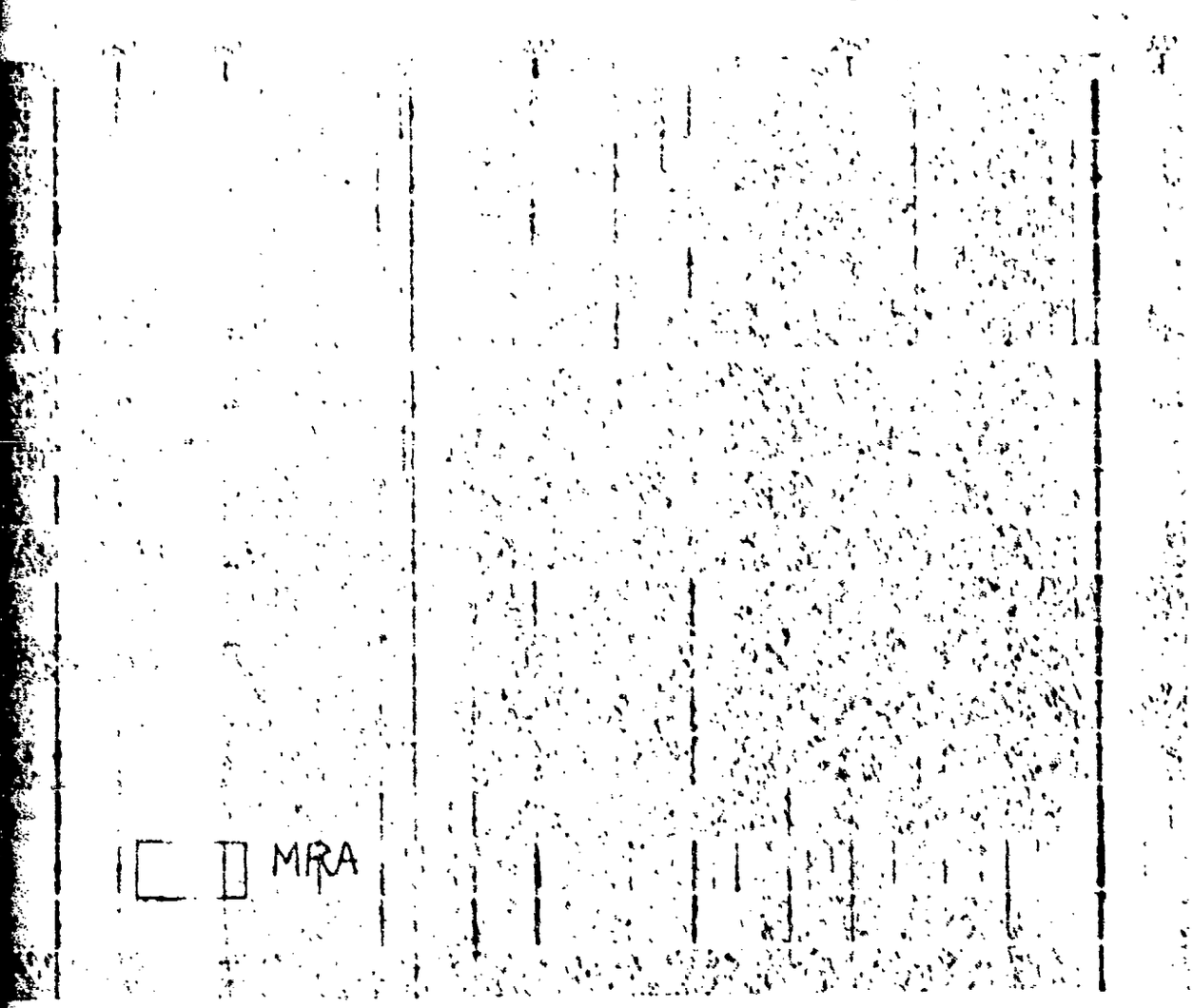
ANALYSIS BAND WIDTH _____ HZ

WATER DEPTH _____ FTS

ELEV

DATE

EXER


MRA

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 9 FREQUENCY 140 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-22.5	
MCPS-32 CAL. CORRECTION	+10	-12.5	
BEAMFORMER GAIN	+12	- .5	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .2	- .3	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-58.7	
MCPS-32 CAL. CORRECTION	+10	-48.7	
BEAMFORMER GAIN	+12	-36.7	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		- .5	
SIGNAL LEVEL FOR SNR	-36.7	36.2	
PROCESSOR CORRECTION	- 4.0	32.2	
MRA CORRECTION	+ .2	32.4	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	- 8.2	24.2	SNR 1 HZ BAND

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 9 FREQUENCY 290 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-13.3	
MCPS-32 CAL. CORRECTION	+10	-3.3	
BEAMFORMER GAIN	+12	+8.7	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .6	+9.3	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-65.2	
MCPS-32 CAL. CORRECTION	+10	-55.2	
BEAMFORMER GAIN	+12	-43.2	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+8.7	
SIGNAL LEVEL FOR SNR	-43.2	51.9	
PROCESSOR CORRECTION	-4.0	47.9	
MRA CORRECTION	+ .6	48.5	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	40.3	SNR 1 HZ BAND

SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 9 FREQUENCY 295 HZ NUMBER OF ELEMENTS 16

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-51.9	
MCPS-32 CAL. CORRECTION	+10	-41.9	
BEAMFORMER GAIN	+12	-29.9	SIG. LEVEL FOR SNR CALCULAT
MRA CORRECTION	+ .8	-29.1	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-64.8	
MCPS-32 CAL. CORRECTION	+10	-54.8	
BEAMFORMER GAIN	+12	-42.8	NOISE LEVEL FOR SNR CALCULA TI

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-29.9	
SIGNAL LEVEL FOR SNR	-42.8	26.9	
PROCESSOR CORRECTION	-4.0	22.9	
MRA CORRECTION	+ .8	23.7	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	15.5	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 9

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-19.4	-12.5	
MRA SIGNAL LEVEL	- .34	+ 9.3	-29.1
ARRAY SIGNAL GAIN	19.0	21.8	
20 LOG 16 (# of elements)	24.0	24.0	24.8
DIFFERENCE	- 5.0	-2.2	

ARRAY GAIN

MRA SNR	32.4	48.5	9.7
MEAN OMNI SNR	28.6	34.5	N.D.
ARRAY GAIN	3.8	14.0	
THEORETICAL AZMUTH GAIN (at MRA)	8.5	11.1	11.0
DIFFERENCE	-4.7	+ 2.9	

CONFIDENTIAL

K·E 10 X 10 TO THE INCH • 5 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

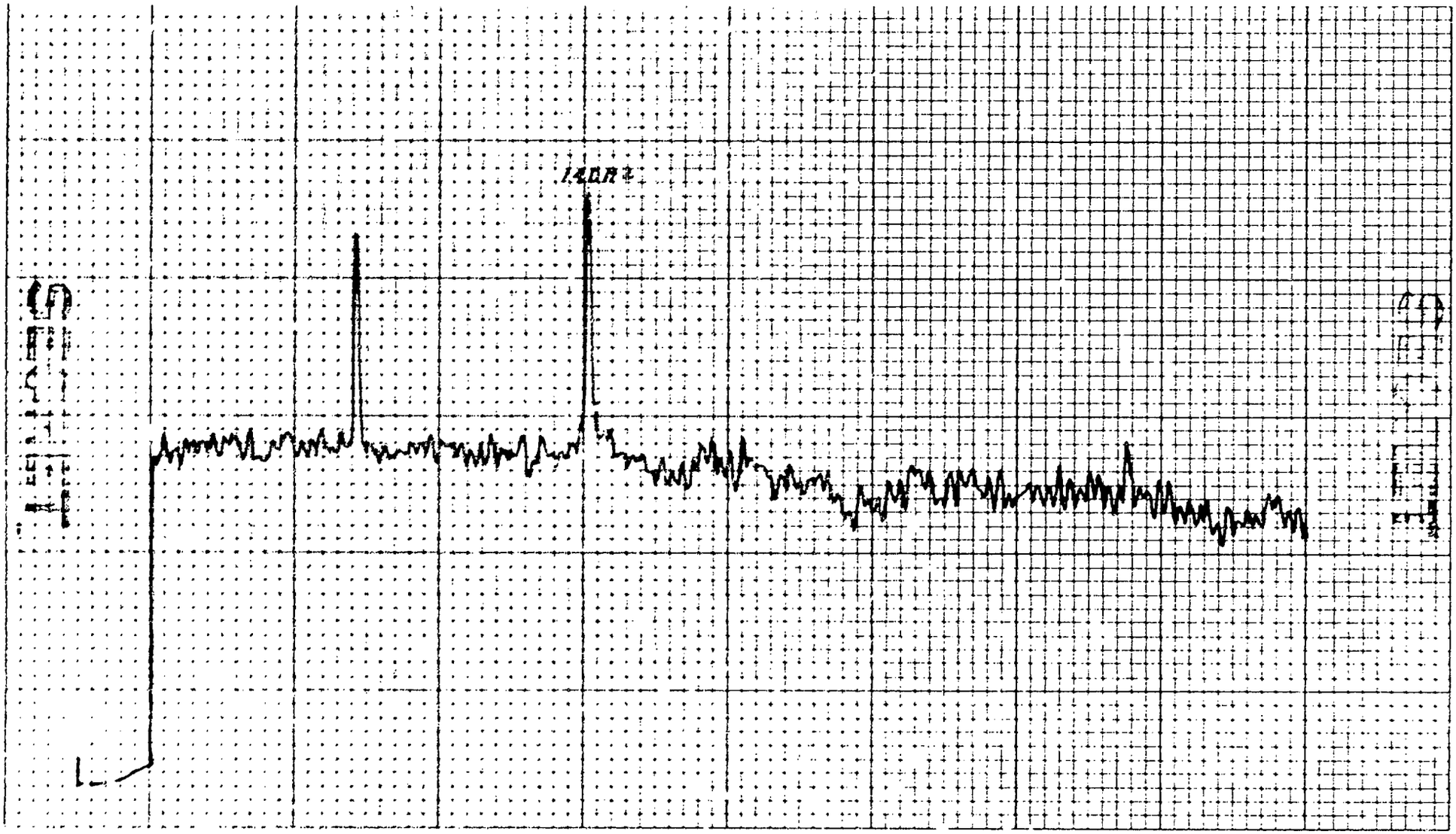
46 0703

CONTROL: 2131 - 16 (DP1)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+36 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -12 DB



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO.

46 0703

CONTROL: 2131 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

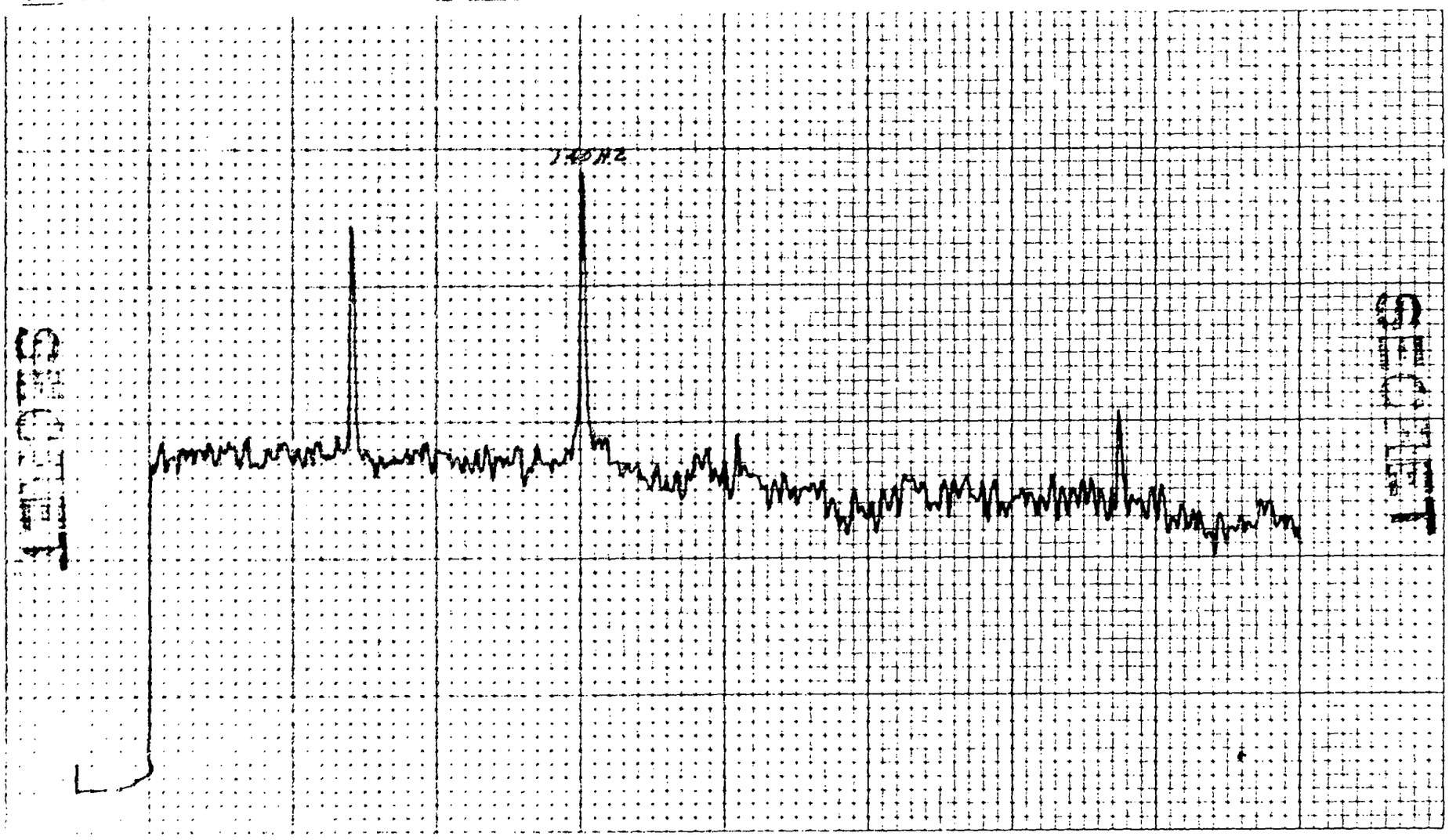
DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+30 DEG. AZ STEERING

REEL: M10

INDEX 3620

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

ATTEN: -12 DB



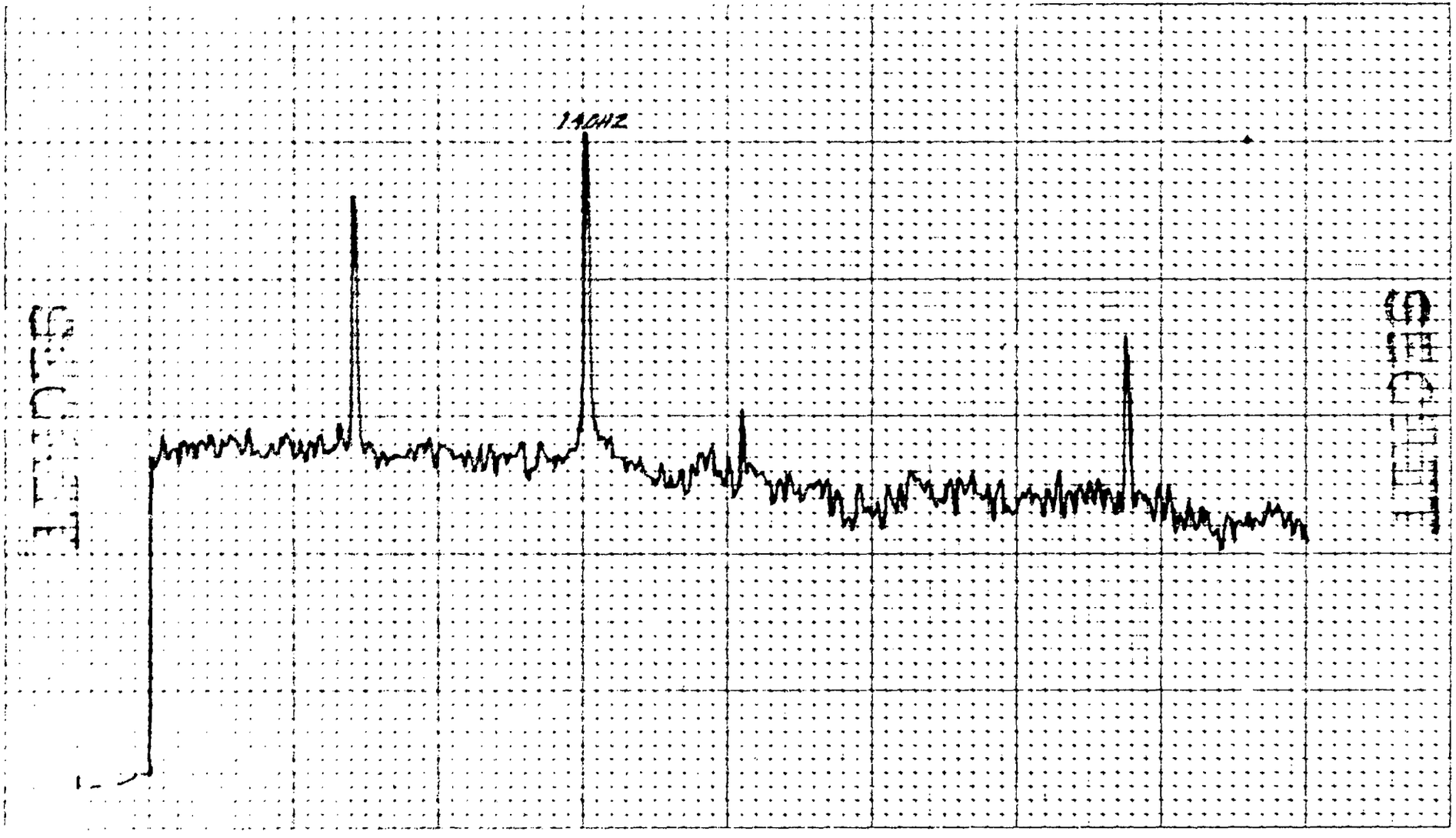
K·E 46 0703

CONTROL: 2131 - 16 (189)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
1-16
DATE/TIME: 3-15-77 - 2131Z
ANALYSIS BANDWIDTH: 1/10HZ
+40 DEG. AZ STEERING

INTEGRATION TIME 320 SECS

REEL: M10
INDEX 3620
ATTEN: -12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DP1)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 159 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+42 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3720
ATTEN: -12 DB

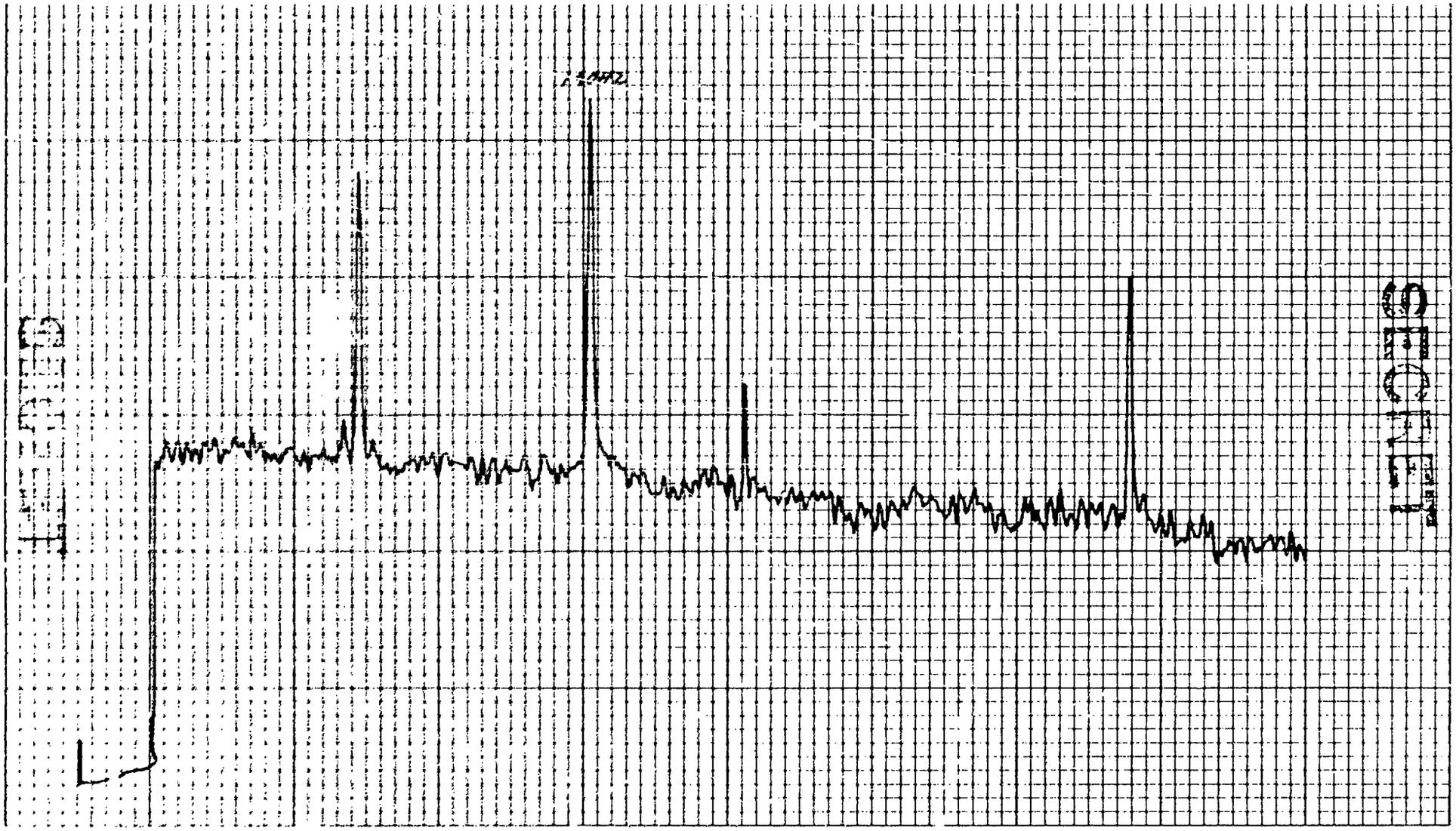
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DPI)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+44 DEG. AZ STEERING

REEL: M10
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: -12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

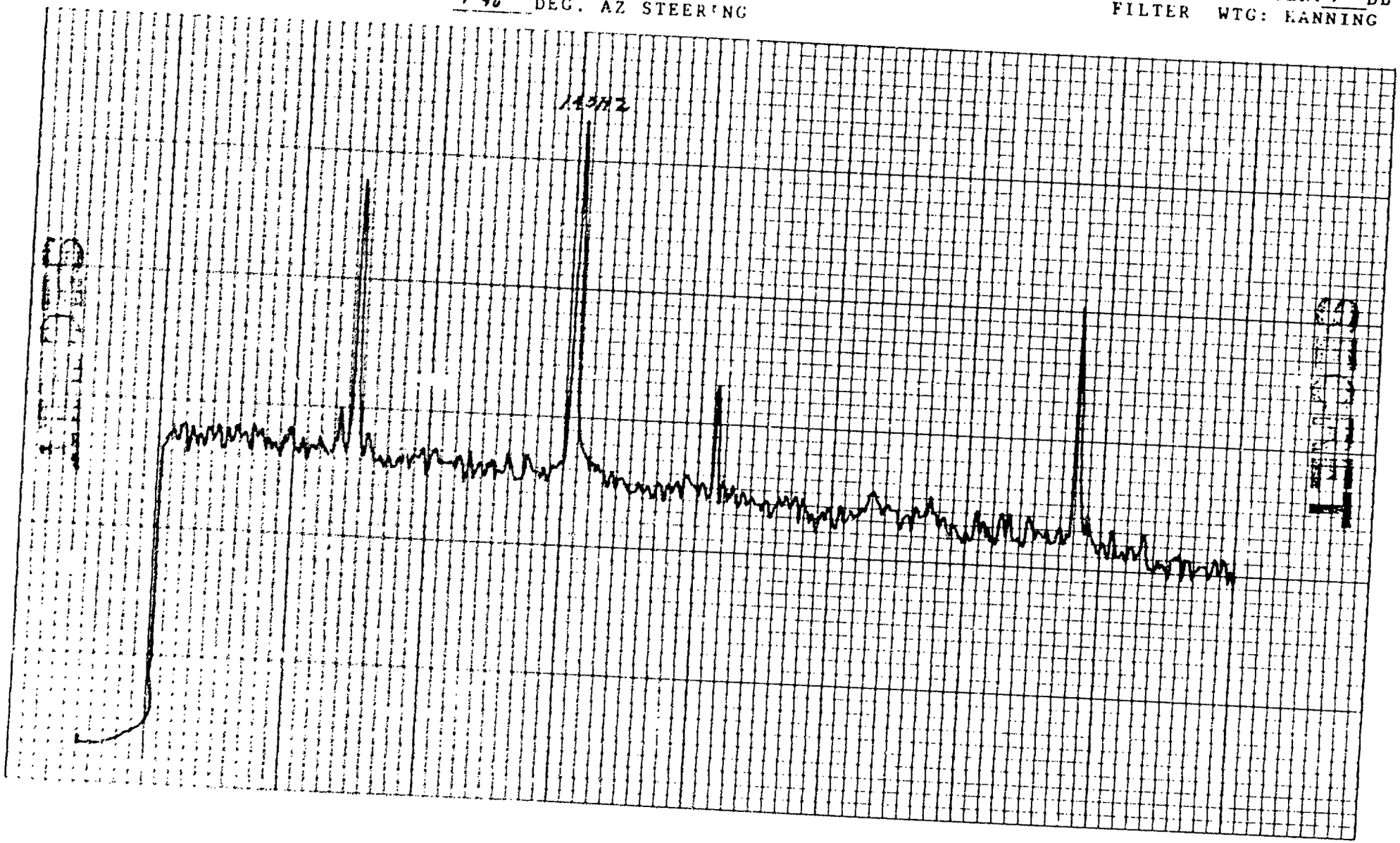
DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+46 DEG. AZ STEERING

REEL: M10

INDEX 3620

INTEGRATION TIME 320 SECS

ATTEN: -12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 5 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

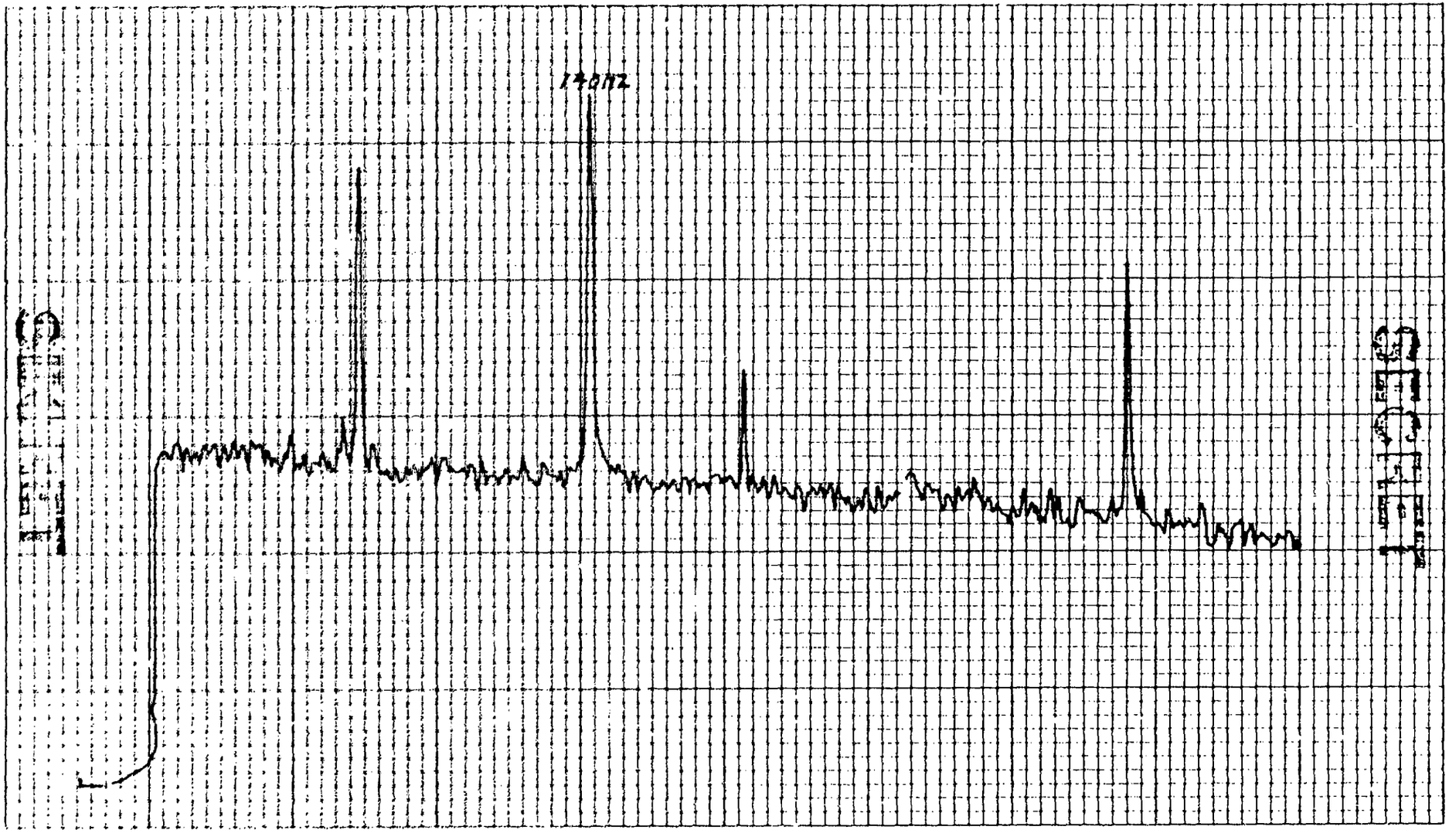
46 0703

CONTROL: 2131 - 16 (DIP)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 7-15-77 - 2131 Z
ANALYS S BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDE X 3620
ATTEN: 72 DB



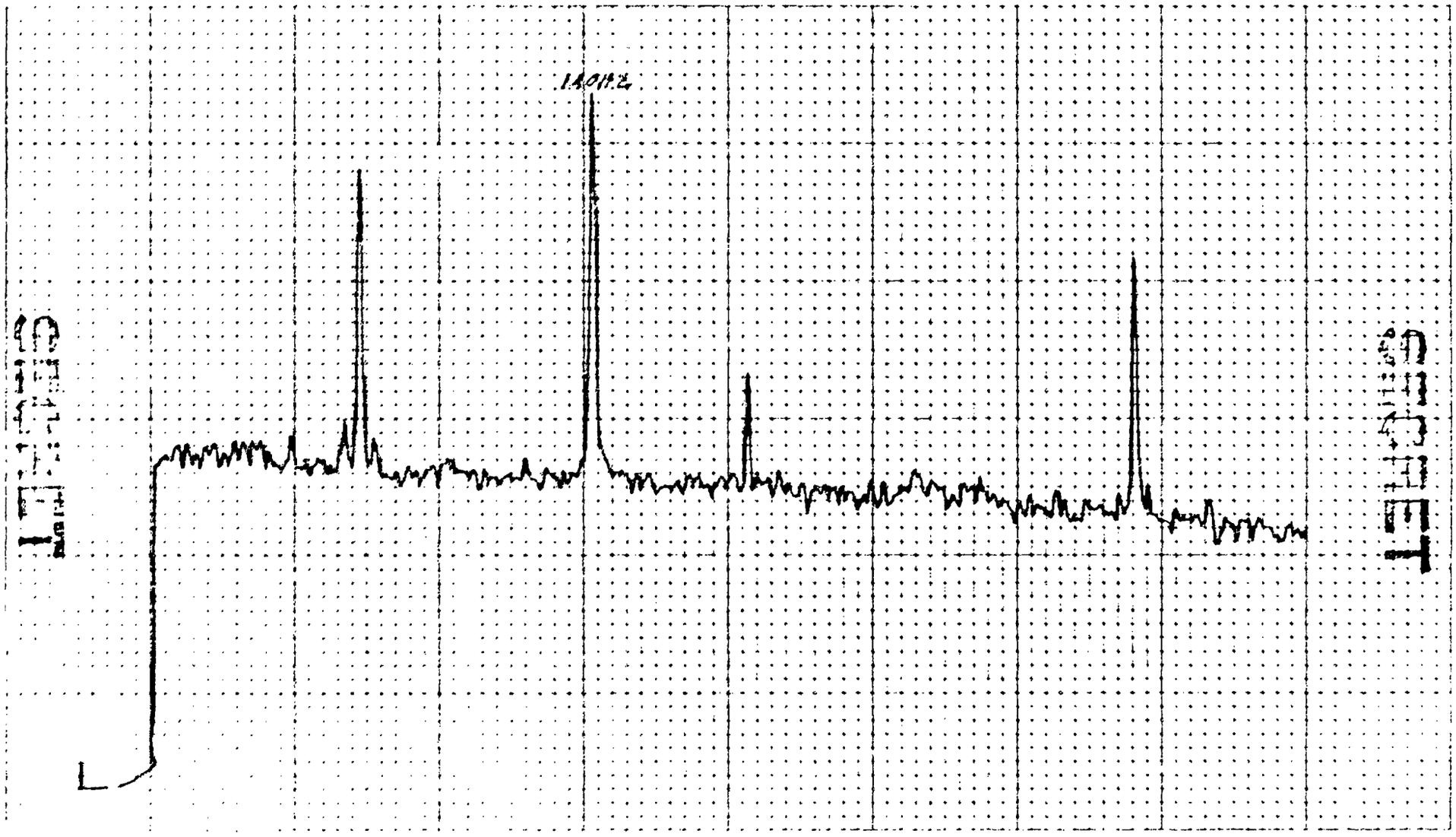
K•E

46 0703

CONTROL: 2131 - 16 (289)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAVE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS:
DATE/TIME: 3-13-77 - 2130 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: A10
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: -12 DB
FILTER WTG: HANNING



K·E

46 0703

CONTROL: 2631 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS:
DATE/TIME: 3 15 79 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+505 DEG. AZ STEERING

REEL: M10

INDEX 3626

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

ATTEN: -12 DB

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46 0703

CONTROL: 2131 - 16 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - -
DATE/TIME: 7-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51 DEG. AZ STEERING

REEL: 410
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: 12 DB
FILTER WTG: HANNING

K·E

46 0703

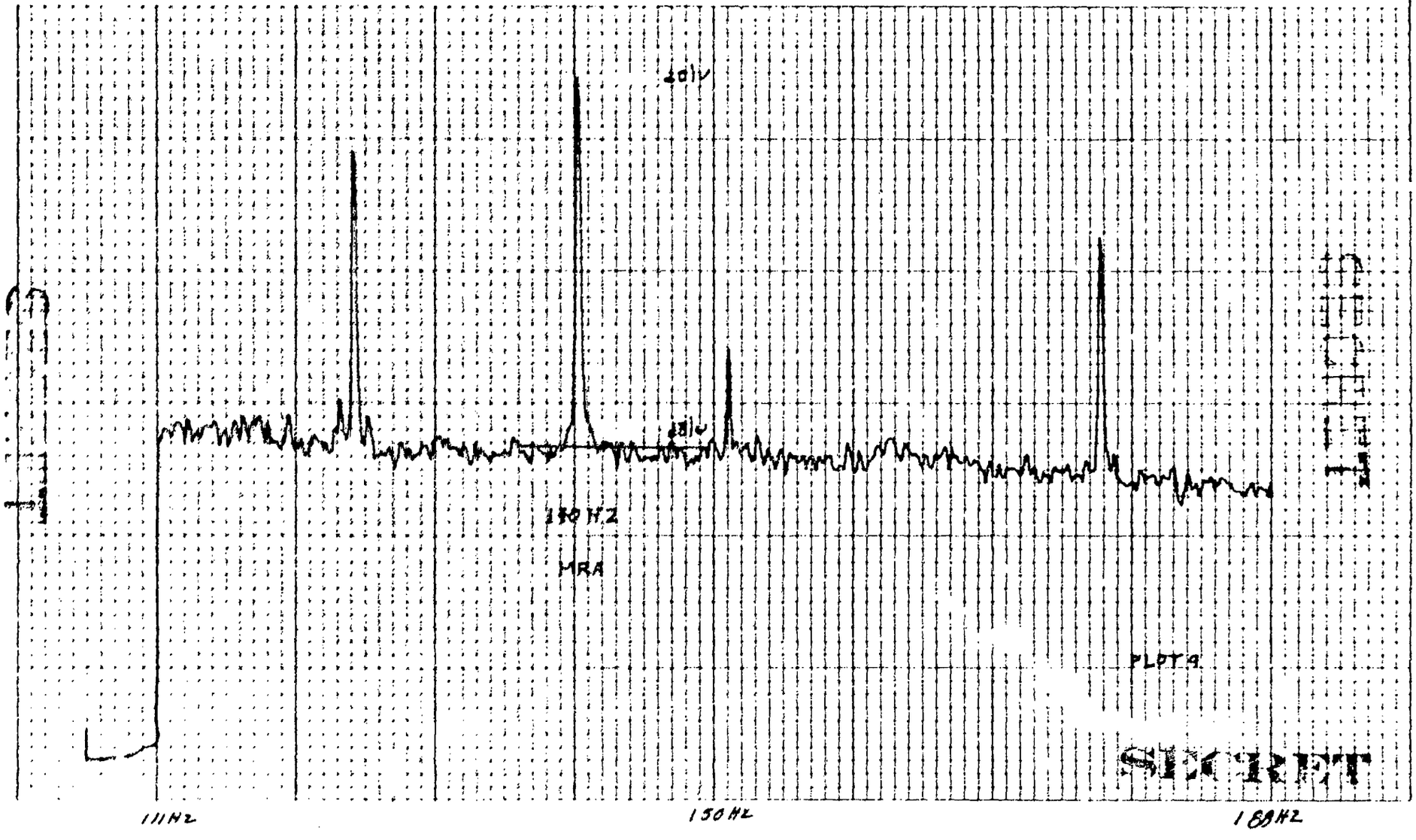
SECRET

CONTROL: 2131 - 51 (DPG)
BEAMFORMED SPECTRUM(ELEMENTS)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: _ _ _
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
151.5 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3690
ATTEN: - DB



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 10 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: A10
INDEX 3620

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

ATTEN: -12 DB

K•E 46 0703

CONTROL: 2131 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAVE
CENTER FREQ: 150 HZ
16 ELEMENTS

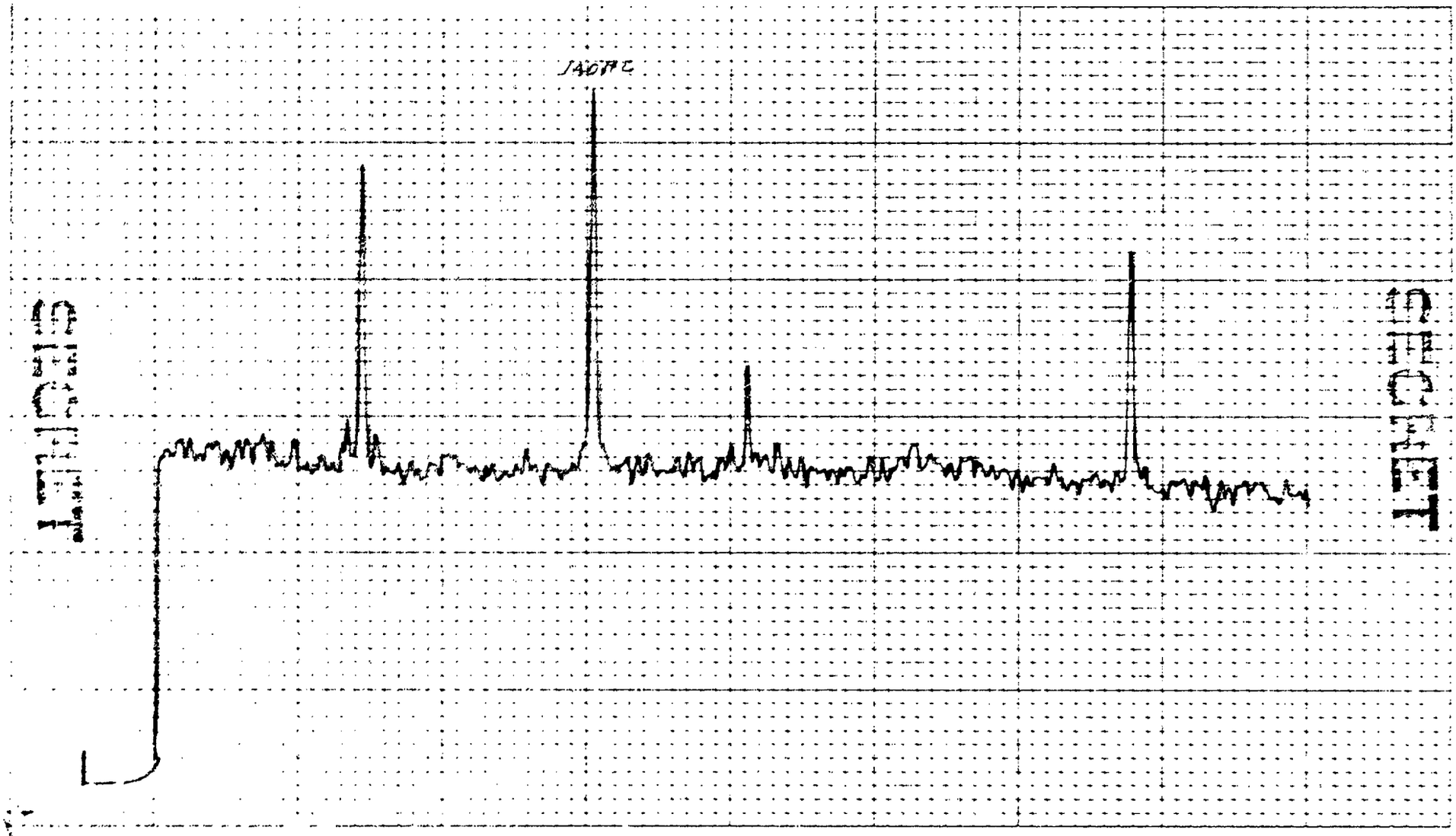
DATE OF ANALYSIS: - - -
/-16
DATE/TIME: 77-2131Z
ANALYSIS BA DWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M10

INDEX X3020

INTEGRATION TIME 320 SECS

ATTEN: 72 DB
FILTER WTG: HANNING



K•E

46 0703

CONTROL: 2131 - 16 (DPY)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 2-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M10

INDEX 3620

INTEGRATION TIME 320 SECS

ATTEN: -12 DB

FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10 HZ
+50 DEG. AT STEERING

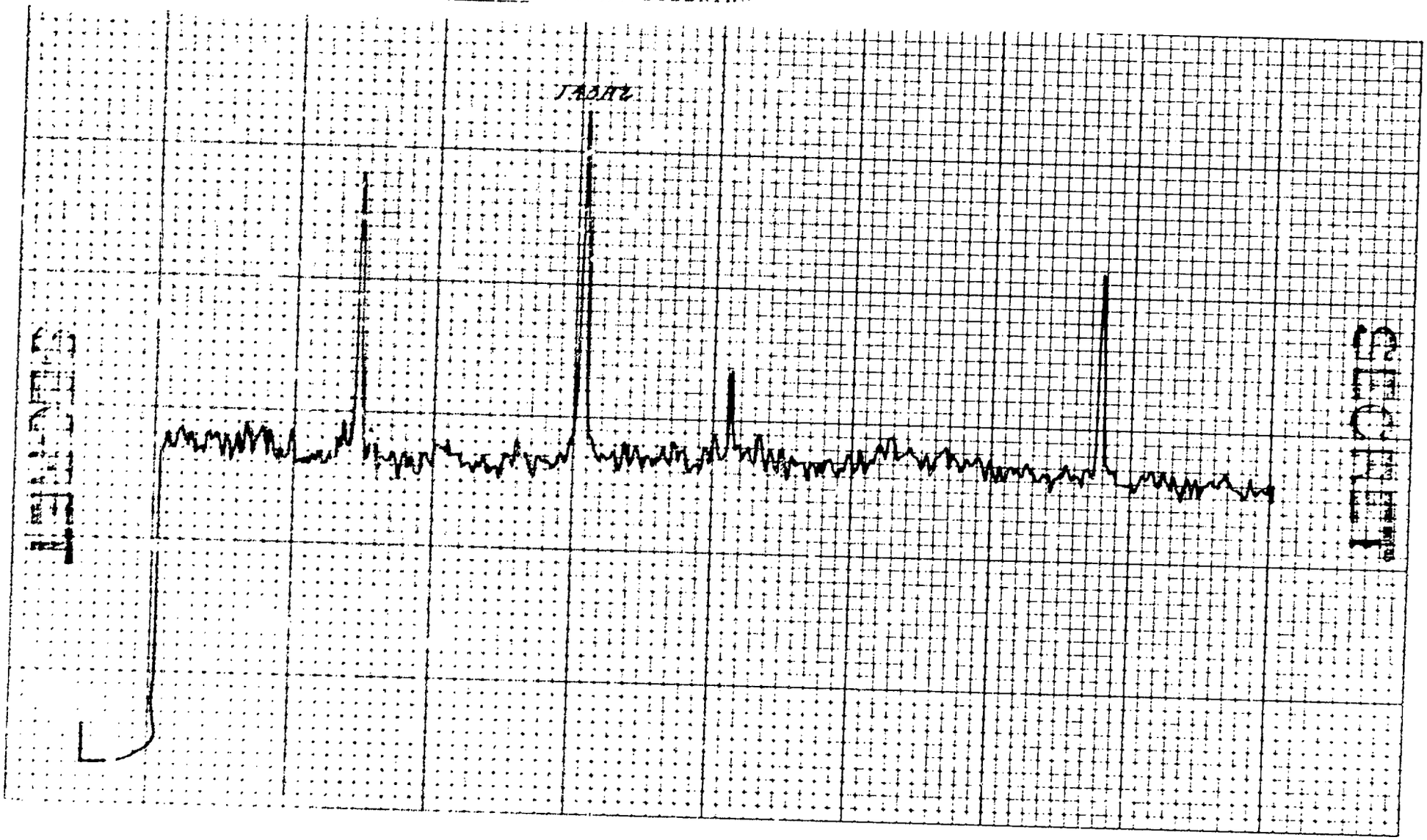
REEL: M10

INDEX 3630

INTEGRATION TIME 320 SECS

ATTEN: - 2 DB

FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: 1410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: 12 DB

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: 1910
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: -12 DB
FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

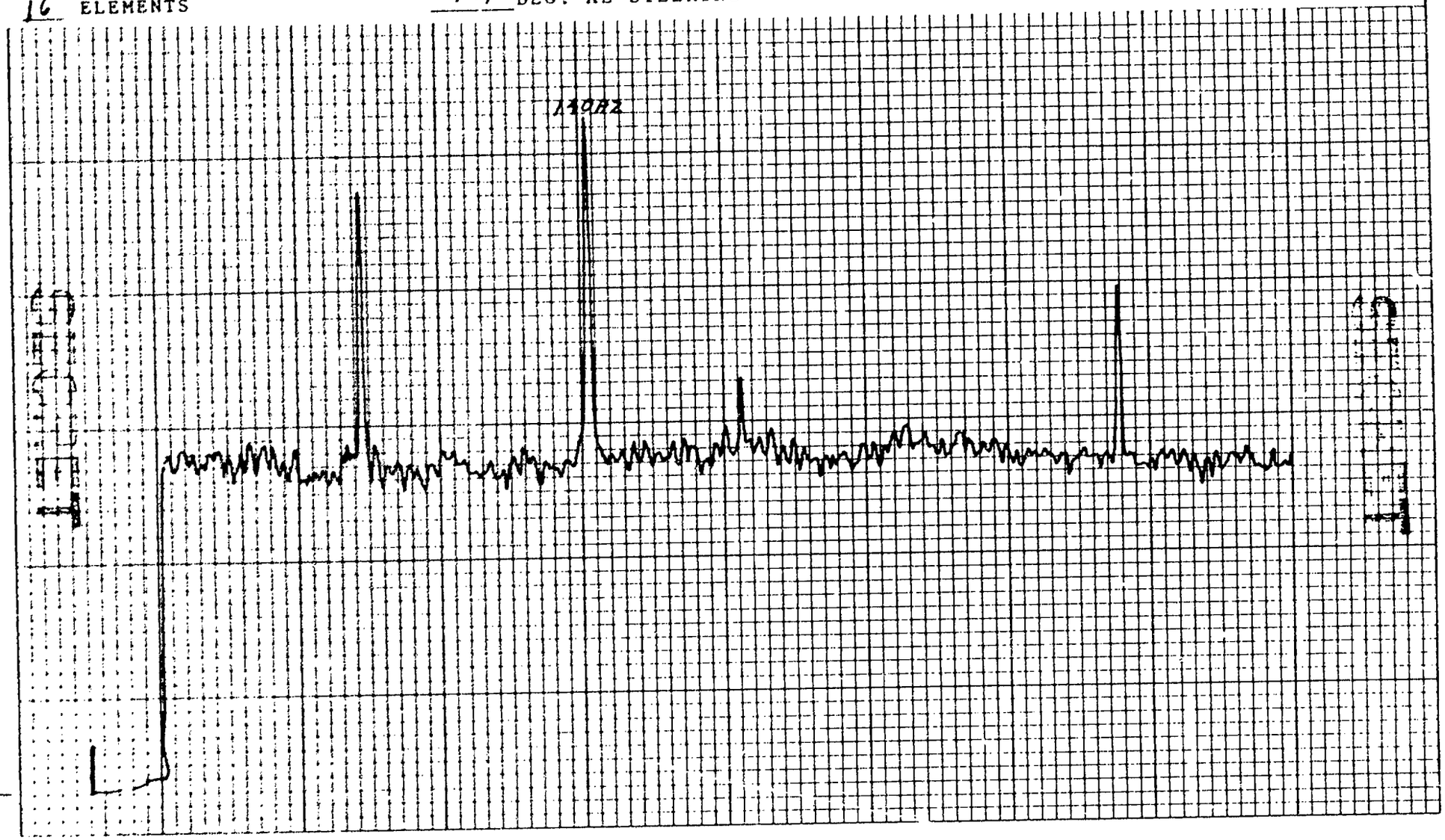
46 0703

CONTROL: 2131 - 16 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15 07 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+69 DEG. AZ STEERING

REEL: 460
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 7620
ATTEN: -12 DB



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -12 DB

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DPI)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131Z
ANALYSIS BANDWIDTH: 1/10HZ
60 DEG. AZ STEERING

REEL: A10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -12 DB

K+E 46 0703

CONTROL: 2131 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAVE
CENTER FREQ: 370 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+36 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -12 DB

K•E

46 0703

CONTROL: 2131 - 16 (DPI)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
(1-16)
DATE/TIME: 7-18-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+38 DEG. AZ STEERING

REEL: 410

INDEX 3620

INTEGRATION TIME 320 SECS

ATTEN: -72 DB

FILTER WTG: HANNING

K·E 10 X 10 TO THE HALF INCH 46 0703

CONTROL: 2131 - 16 (DM)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 370 HZ
16 ELEMENTS

DATE OF ANALYSIS: -- -- --
1-16
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+40 DEG. AZ STEERING

REEL: 410 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: -12 DB
FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH 46 0703

CONTROL: 2130 - 16 (DPI)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+42 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3680
ATTEN: -12 DB

K·E 46 0703

CONTROL: 2031 - 16 (DP?)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

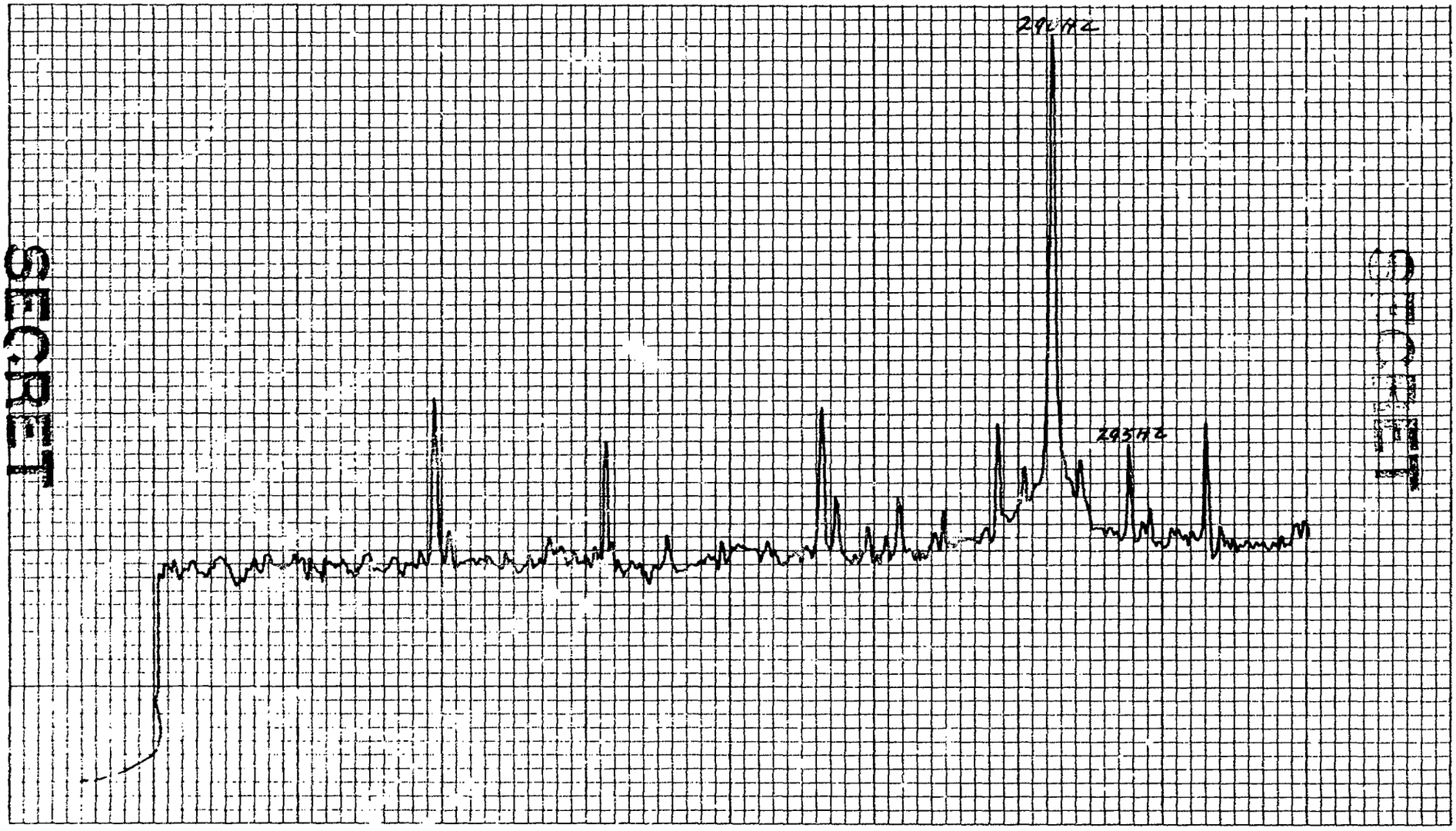
DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-15-77 - 2131Z
ANALYSIS BANDWIDTH: 1/10HZ
+44 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 362c
ATTEN: -12 DB

46 0703

CONTROL: 2131 - 16 (DPQ) DATE OF ANALYSIS: — — — REEL: M10 INDEX 3620
BEAMFORMED SPECTRUM (ELEMENTS 1-16)
EXERCISE: BEARING STAKE DATE/TIME: 3-15-77 - 2131 Z INTEGRATION TIME 320 SECS ATTEN: -12 DB
CENTER FREQ: 270 HZ ANALYSIS BANDWIDTH: 1/10HZ FILTER WTG: HANNING
16 ELEMENTS +46 DEG. AZ STEERING



K+E

46 0703

CONTROL: 2131 - 16 (DPP)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

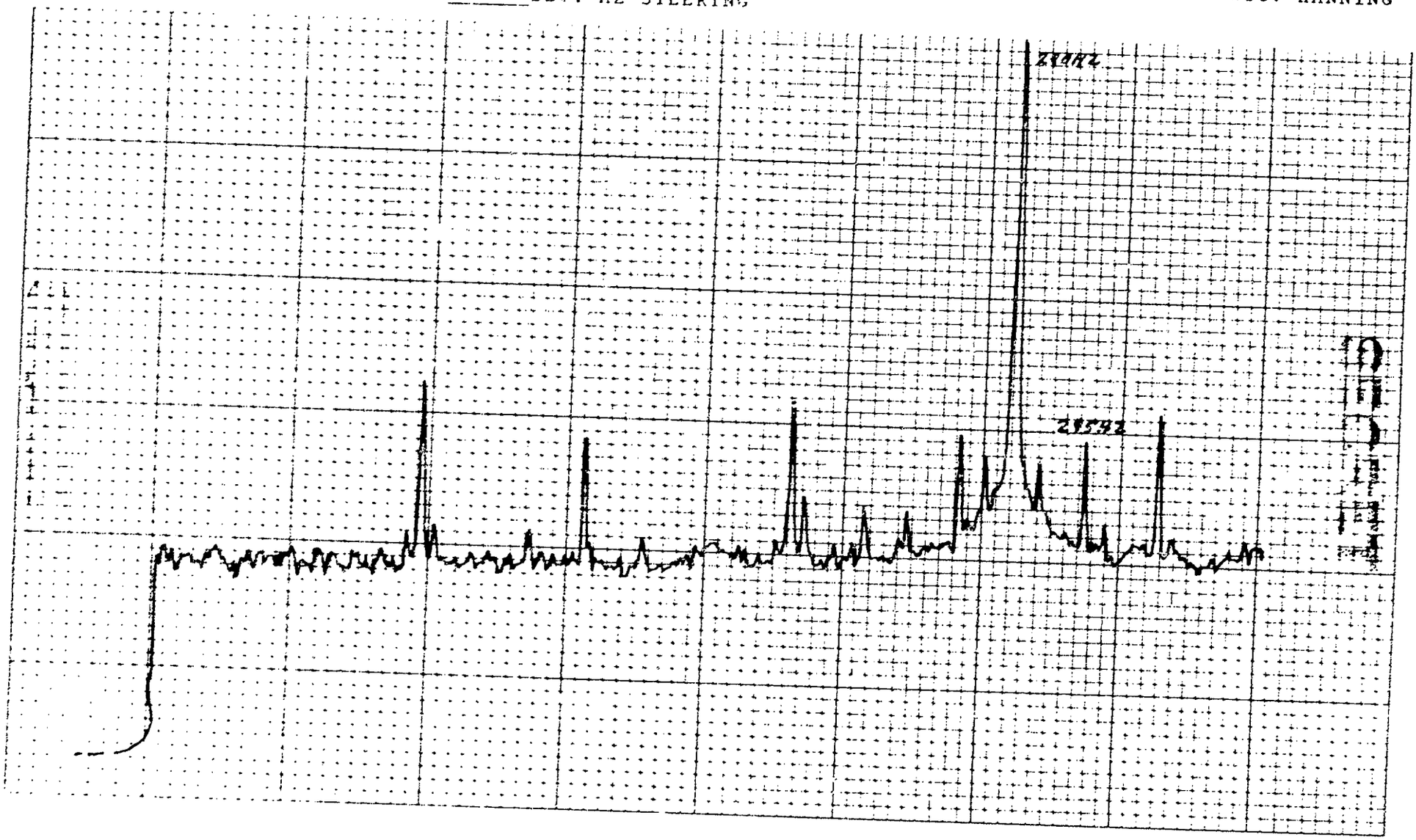
DATE OF ANALYSIS: 1-16
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: 416

INDEX 3620

INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

ATTEN: -12 DB



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DPQ)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

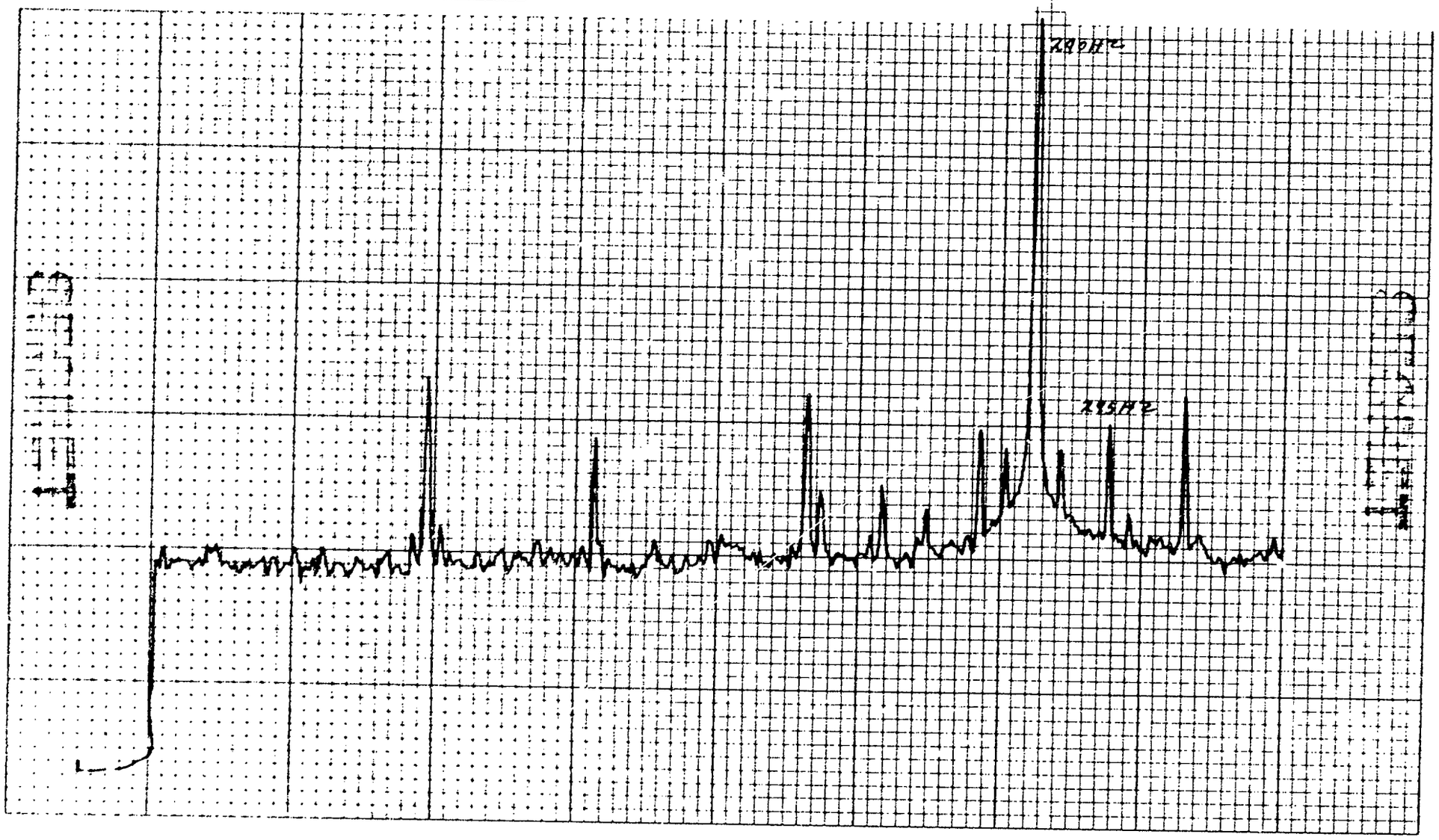
REEL: M10

INDEX 3620

INTEGRATION TIME 320 SECS

ATTEN: 72 DB

FILTER WTG: HANNING



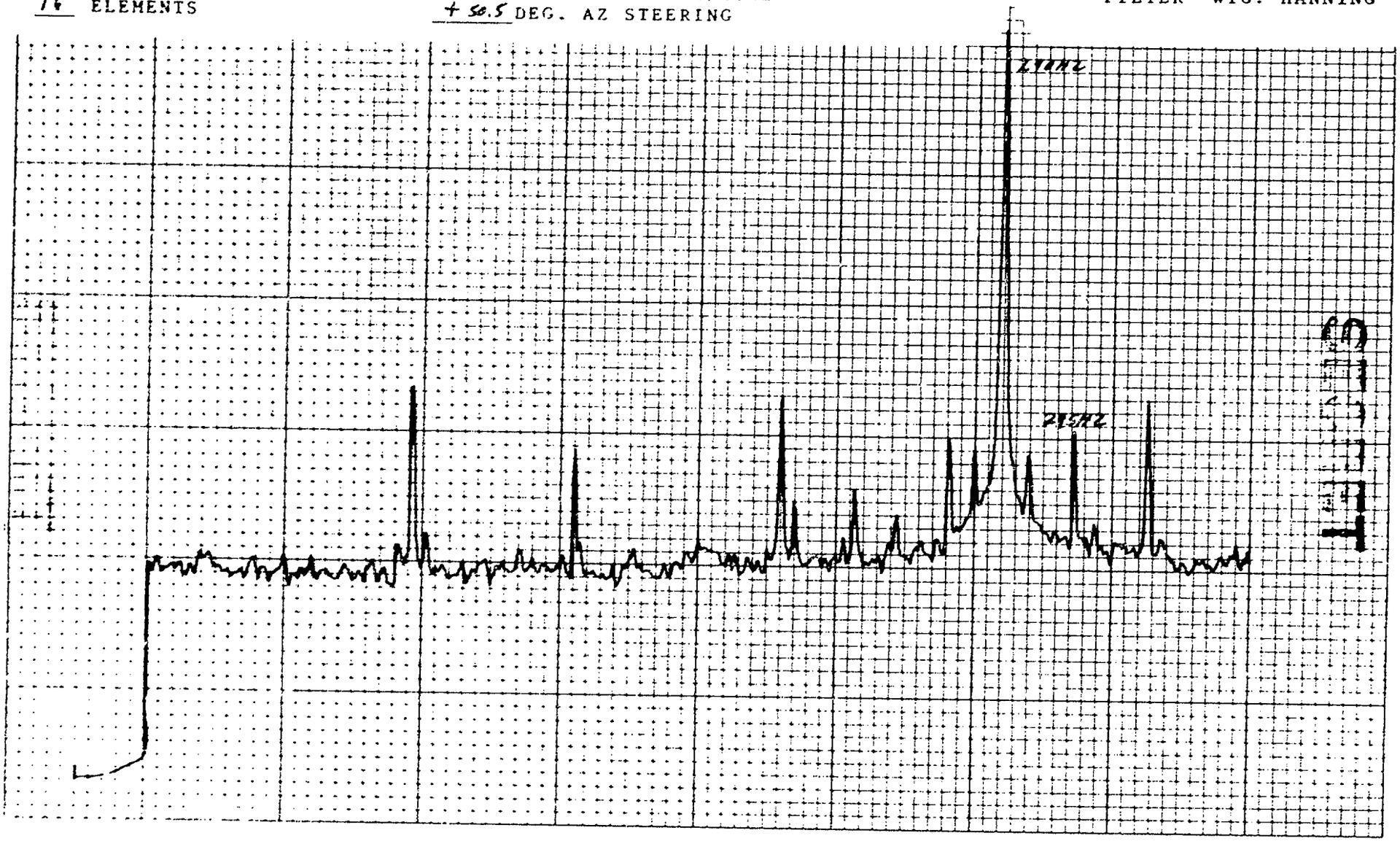
K·E 10 X 10 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+ 50.5 DEG. AZ STEERING

REEL: 410
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: -12 DB
FILTER WTG: HANNING



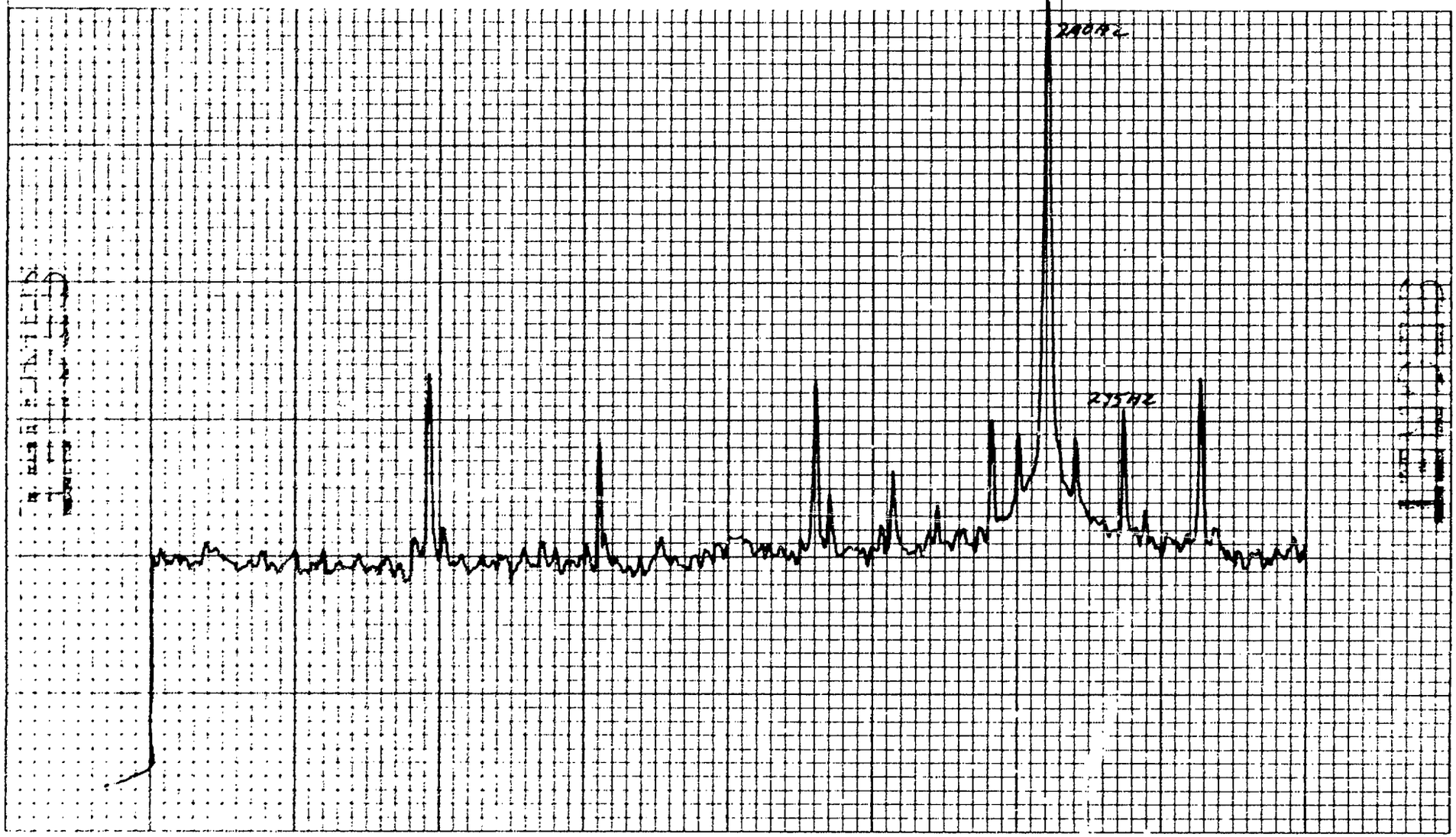
46 0703

CONTROL: 2131 - 16 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51 DEG. AZ STEERING

REEL: M10
INDEX 3620

INTEGRATION TIME 320 SECS
ATTEN: -72 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

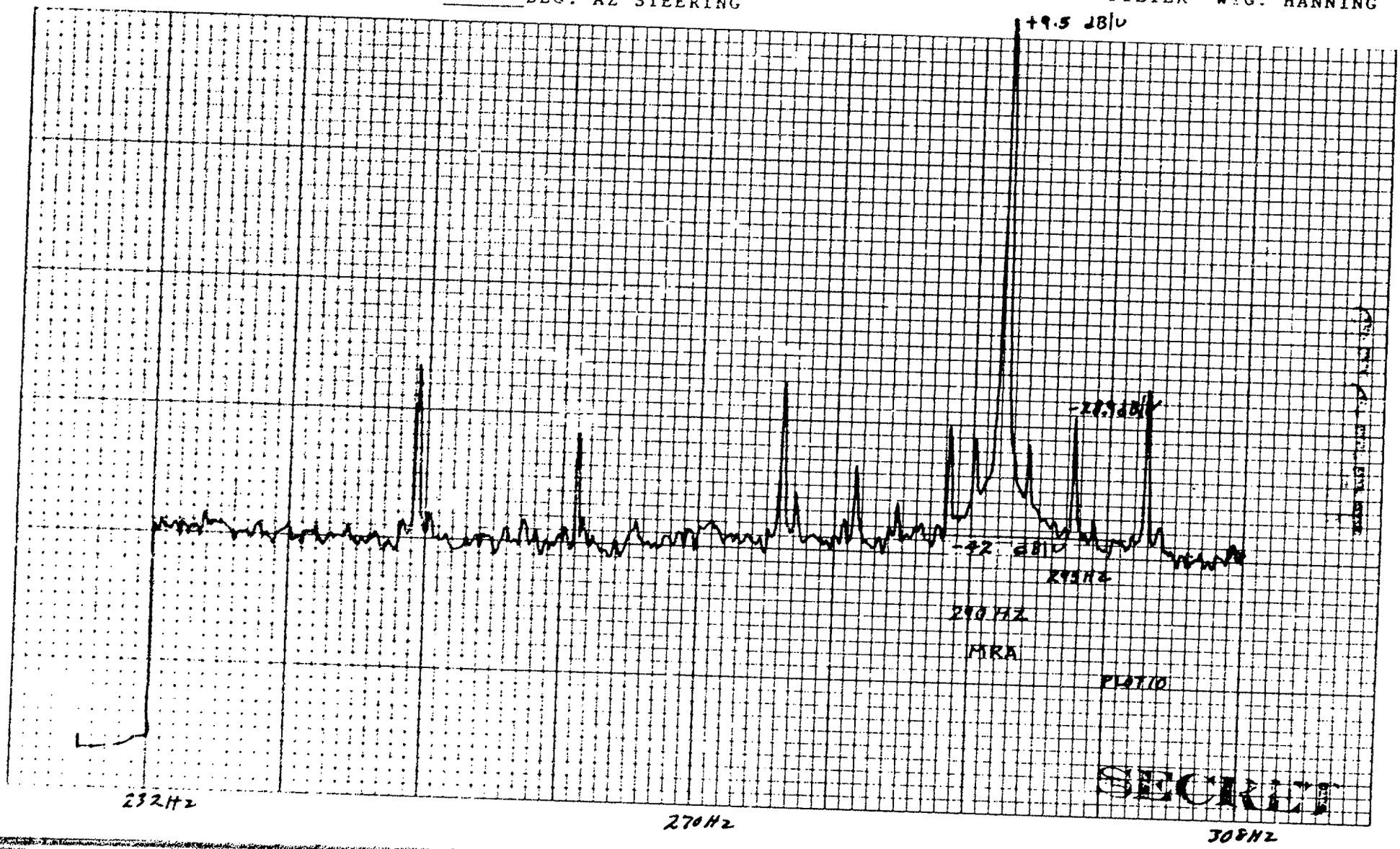
SECRET

CONTROL: 2131 - 61 (BPA)
BEAMFORMED SPECTRUM (ELEMENTS 1 TO 16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — — —
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51.5 DEG. AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: - DB
FILTER WTG: HANNING



SECRET

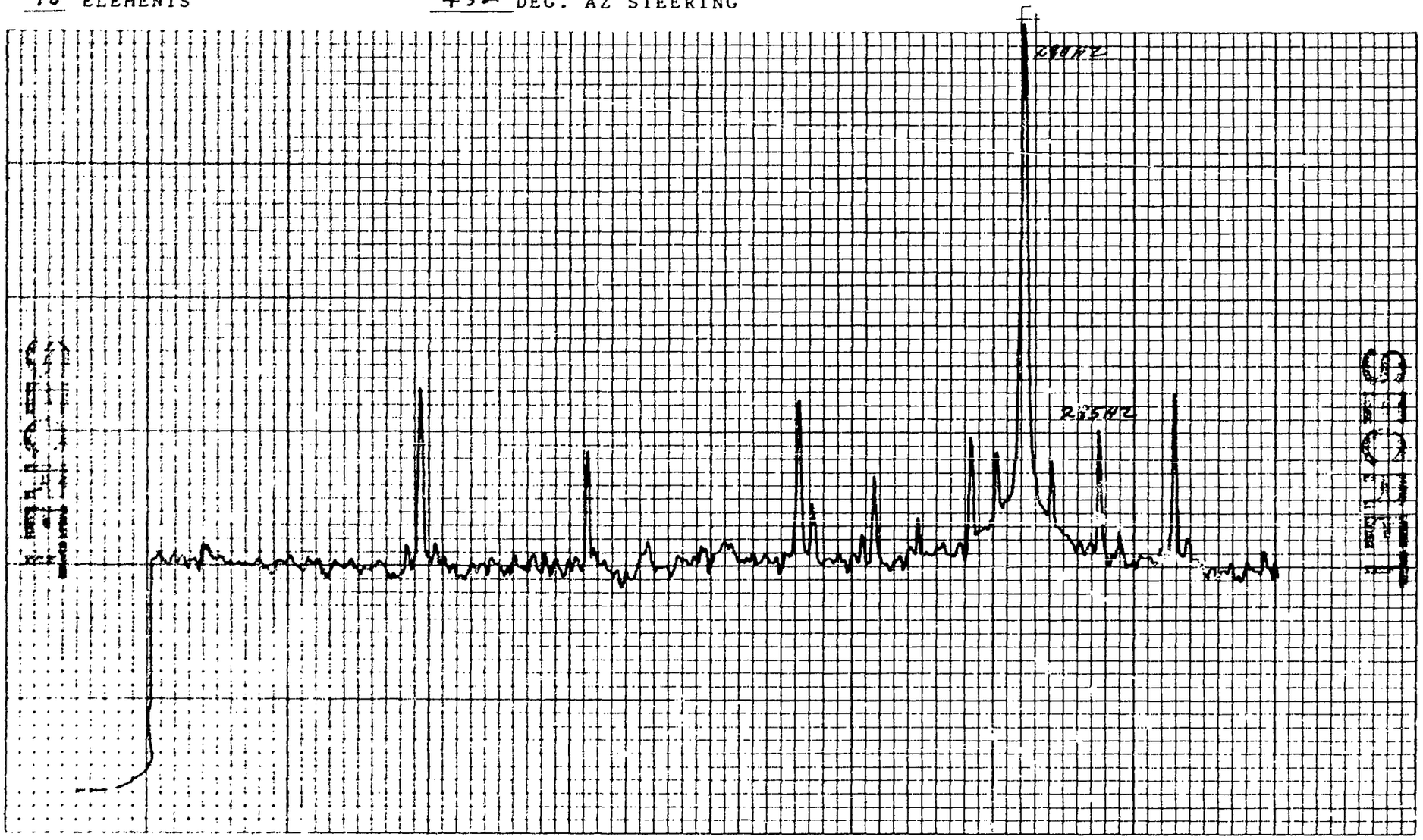
46 0703

CONTROL: 2131 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: A10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -12 DB



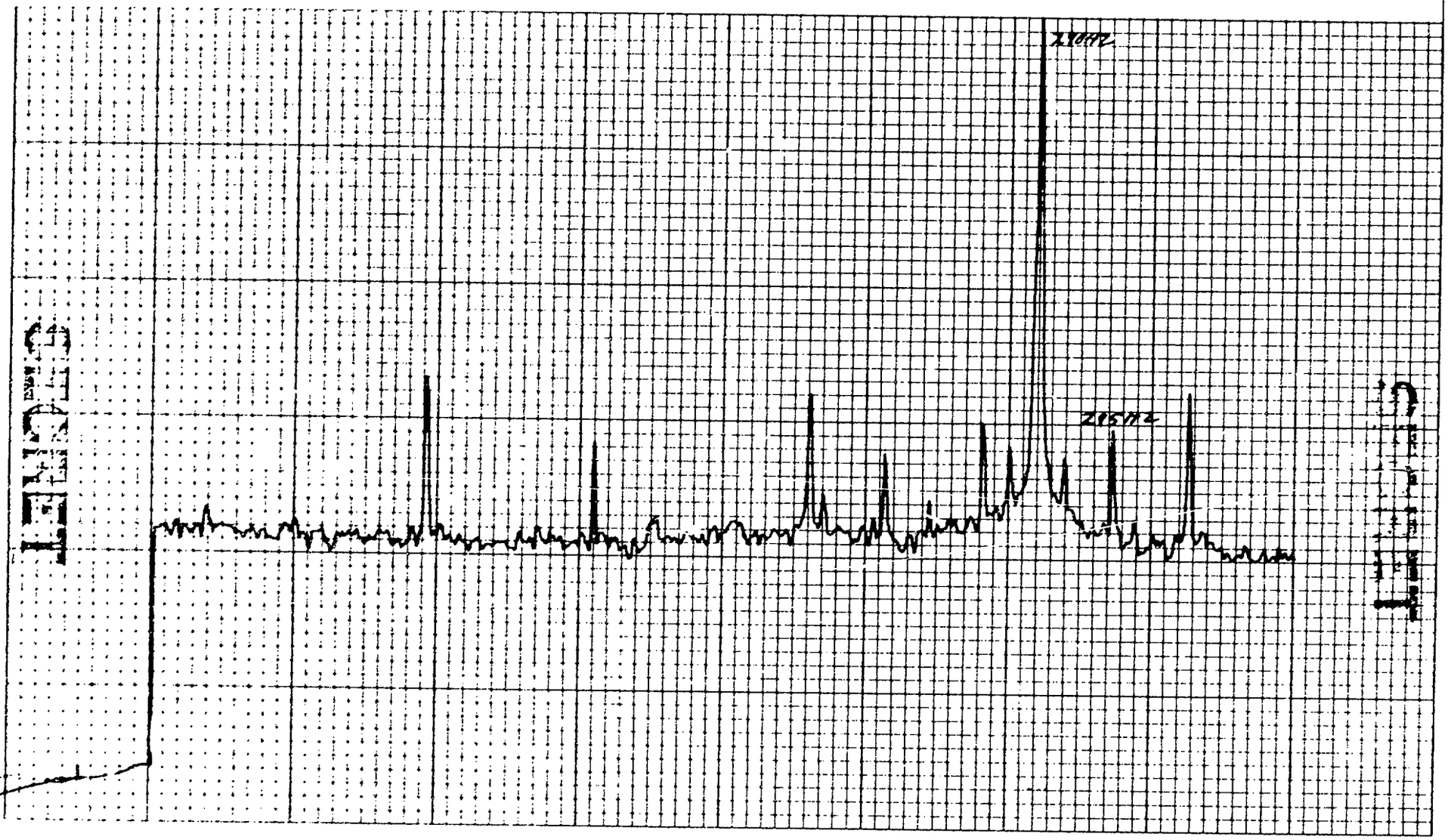
K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (289)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 315-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M10
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: -12 DB
FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

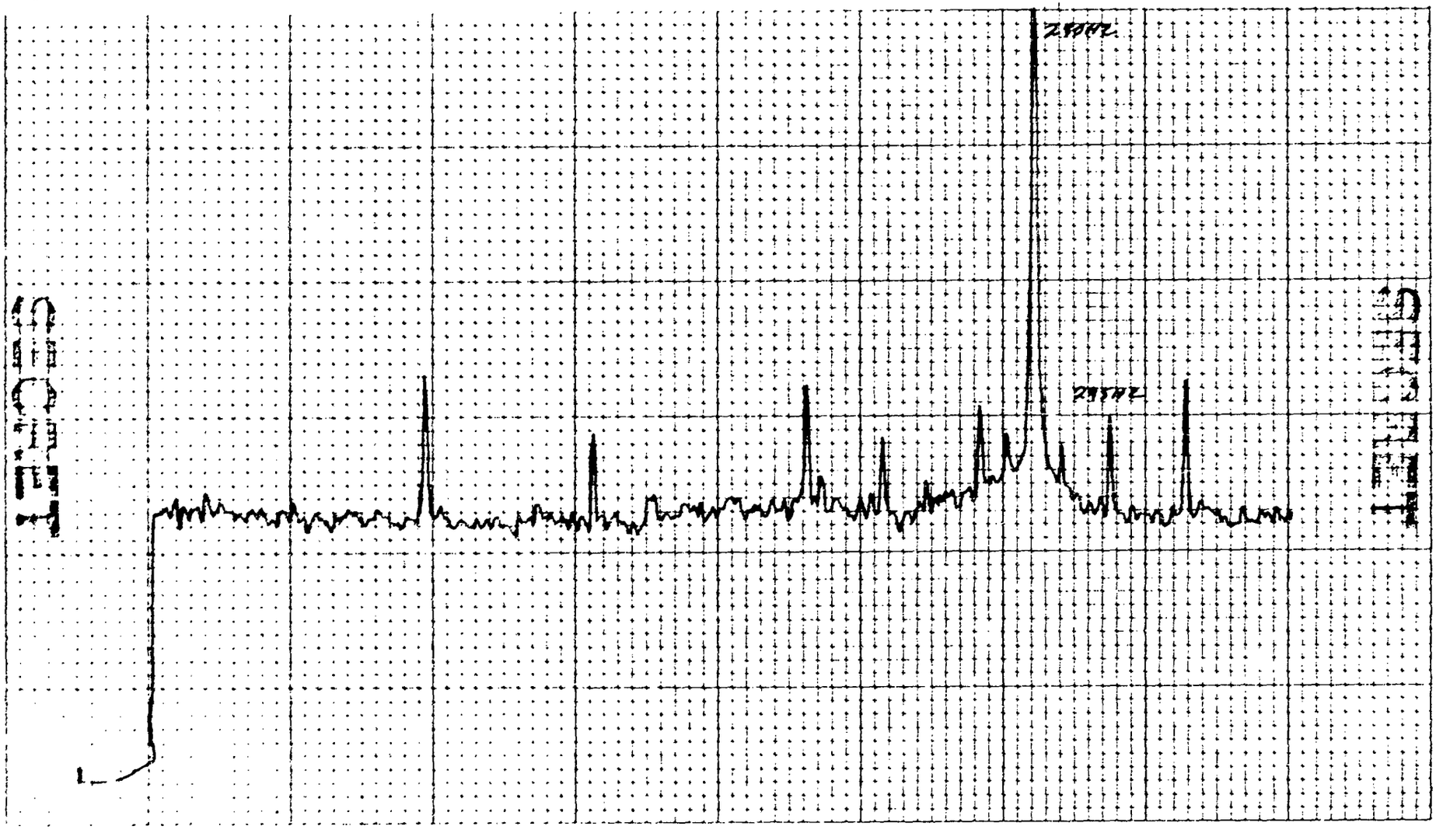
46 0703

CONTROL: 2131 - 16 (DAY)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-16-77-2131Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -12 DB



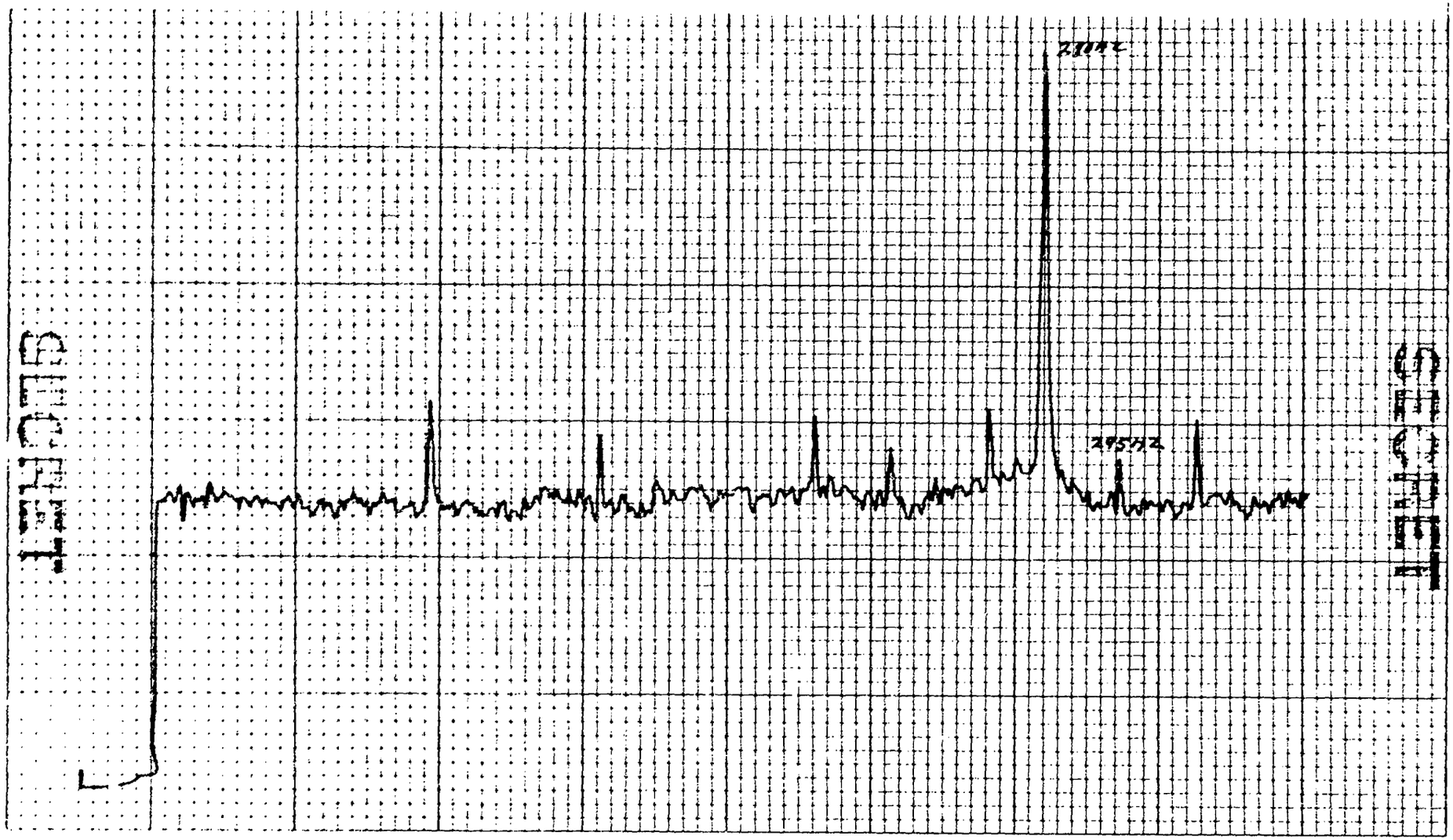
K•E 10 X 10 TO THE INCH • 7 X 10 INCHES PRINTED IN U.S.A.

46 0703

CONTROL: 2031 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M10
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: -12 DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

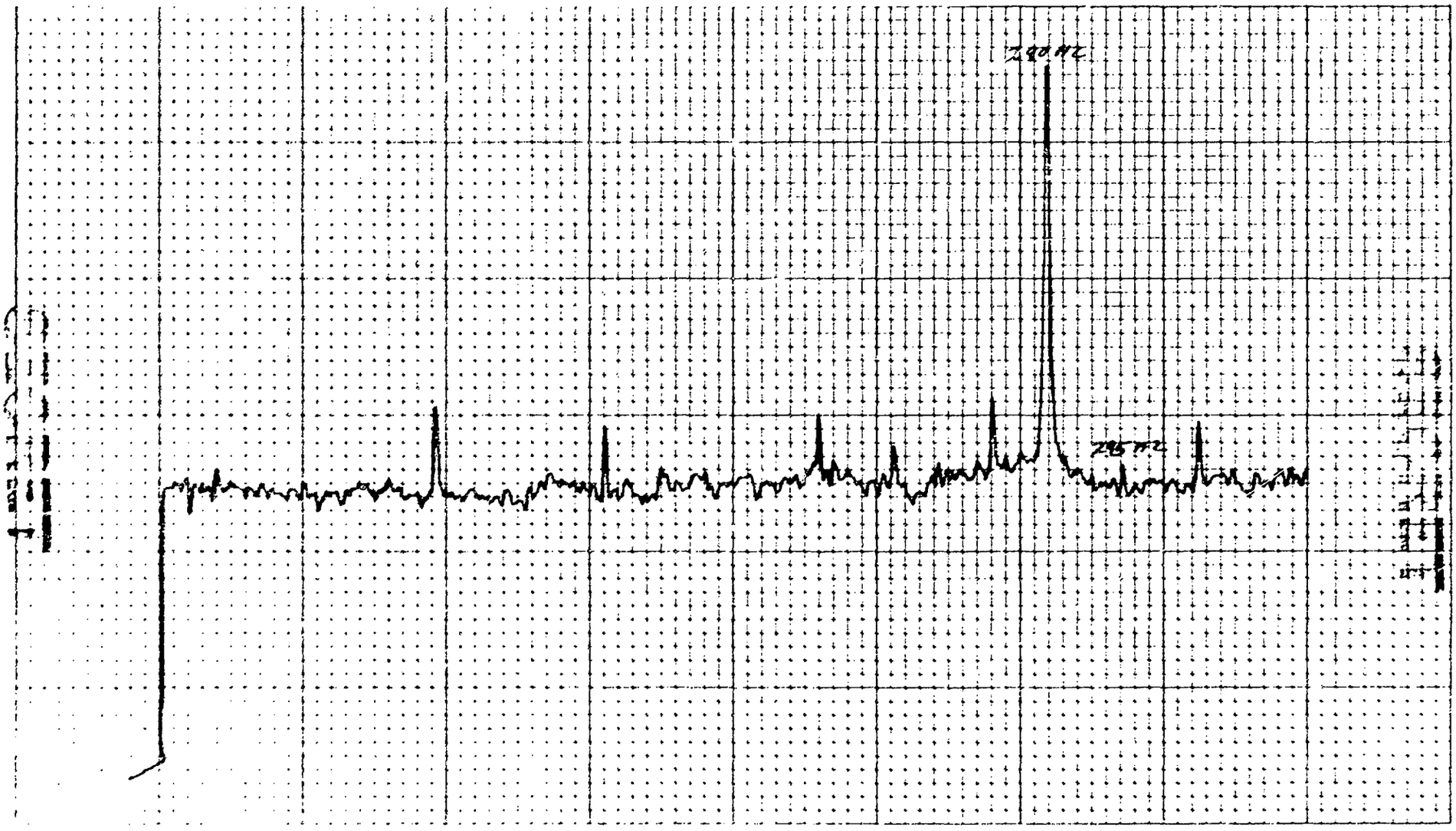
46 0703

CONTROL: 3031 - 16 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ. 290 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-7 - 2131 Z
ANALYSIS BANDWIDTH. 1/10HZ
+60 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -12 DB



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

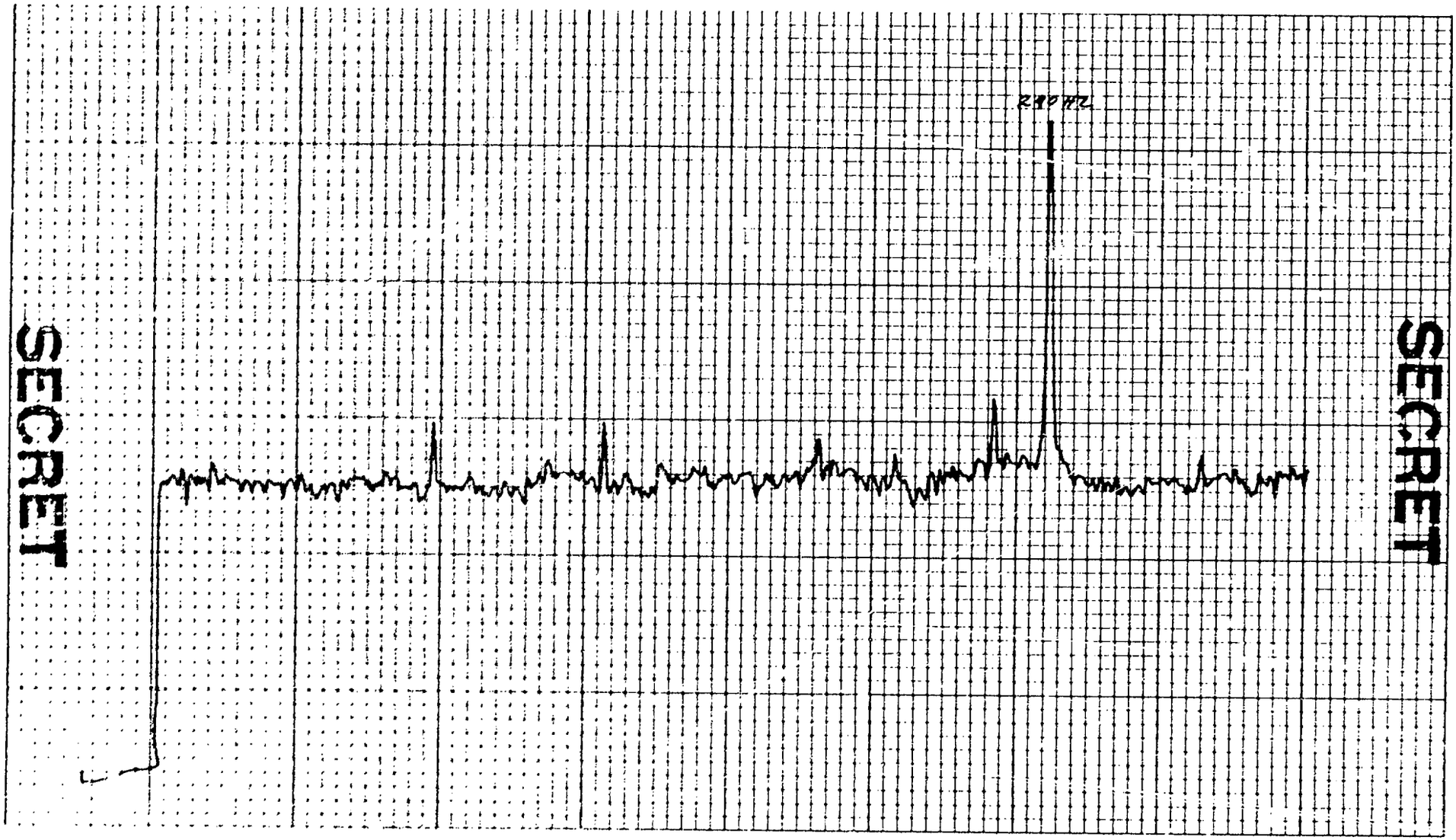
46 0703

CONTROL: 2131 - 16 (DPY)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 3131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+62 DEG. AZ STEERING

REEL: M10
INDEX 3620

INTEGRATION TIME 320 SECS
ATTEN: -12 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DPI)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 7-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+64 DEG. AZ STEERING

REEL: M10

INTEGRATION TIME 320 SECS

INDEX 3620

ATTEN: -12 DB
FILTER WTG: HANNING

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 16 (DMP)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+66 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER

INDEX 3620
ATTEN: -12 DB
WTG: HANNING

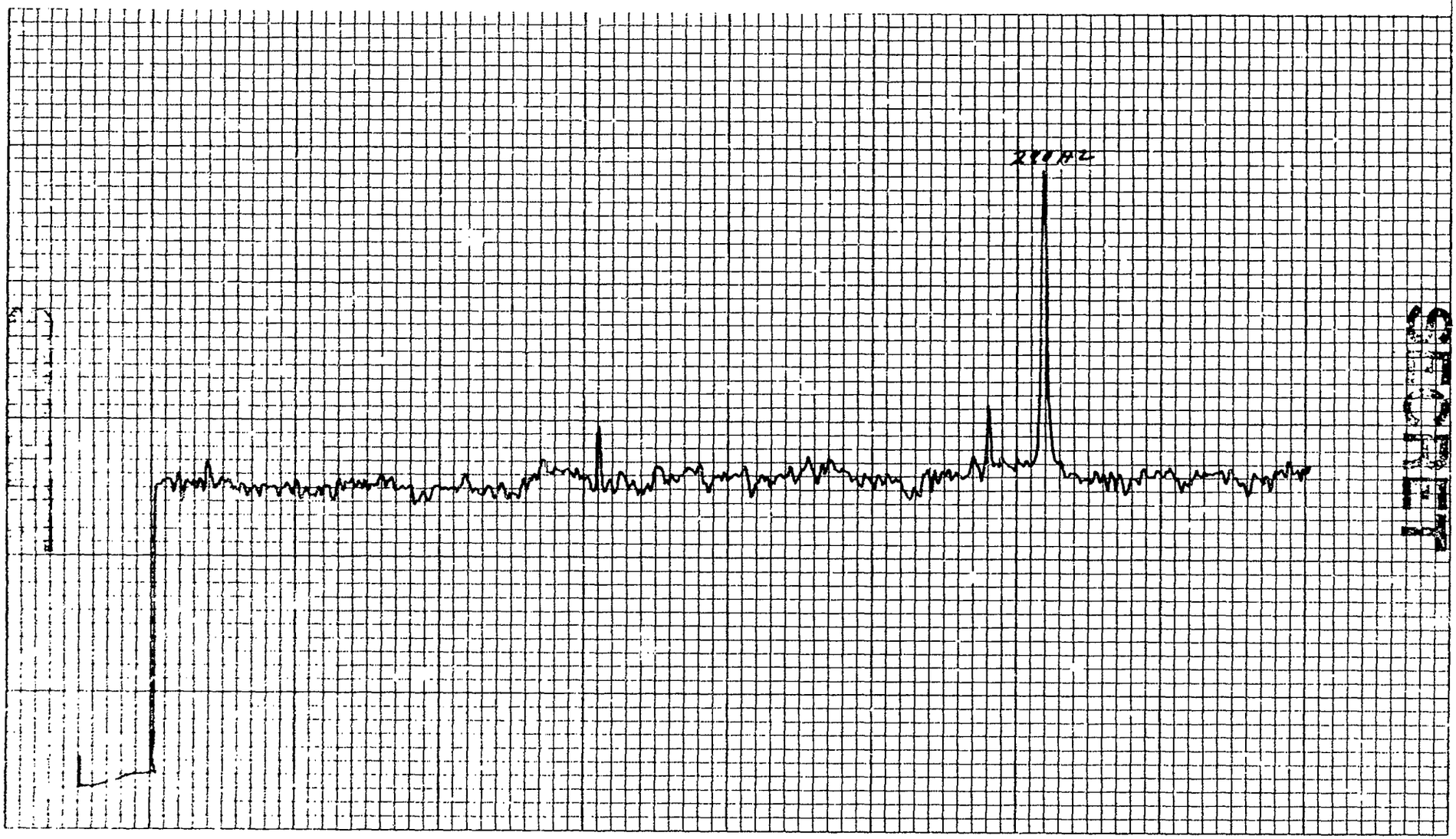
46 0703

CONTROL: 2/31 - 16 (DPA)
BEAMFORMED SPECTRUM(ELEMENTS 1-16)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
16 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+68 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3670
ATTEN: -12 DB



SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 9 FREQUENCY 140 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-21.9	
MCPS-32 CAL. CORRECTION	+10	-11.9	
BEAMFORMER GAIN	+24	+12.1	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .2	+12.3	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-64.5	
MCPS-32 CAL. CORRECTION	+10	-54.5	
BEAMFORMER GAIN	+24	-30.5	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+12.1	
SIGNAL LEVEL FOR SNR	-30.5	42.6	
PROCESSOR CORRECTION	-4.0	38.6	
MRA CORRECTION	+ .2	38.8	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	30.6	SNR 1 HZ BAND

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 9 FREQUENCY 290 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-14.2	
MCPS-32 CAL. CORRECTION	+10	-4.2	
BEAMFORMER GAIN	+24	+19.9	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .6	+20.5	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-67.1	
MCPS-32 CAL. CORRECTION	+10	-57.1	
BEAMFORMER GAIN	+24	-33.1	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+19.9	
SIGNAL LEVEL FOR SNR	-33.1	53.0	
PROCESSOR CORRECTION	-4.0	49.0	
MRA CORRECTION	+ .6	49.6	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	41.4	SNR 1 HZ BAND

CONFIDENTIAL

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 9 FREQUENCY 295 HZ NUMBER OF ELEMENTS 32

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-52.7	
MCPS-32 CAL. CORRECTION	+10	-42.7	
BEAMFORMER GAIN	+24	-18.7	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .9	-17.8	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-67.2	
MCPS-32 CAL. CORRECTION	+10	-57.2	
BEAMFORMER GAIN	+24	-33.2	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-18.7	
SIGNAL LEVEL FOR SNR	-33.2	14.5	
PROCESSOR CORRECTION	-4.0	10.5	
MRA CORRECTION	+ .9	11.4	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	3.2	SNR 1 HZ BAND

CONFIDENTIAL

DATA POINT 9

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-19.4	-17.5	N.D
MRA SIGNAL LEVEL	+12.3	+20.4	-17.8
ARRAY SIGNAL GAIN	31.7	32.9	
20 LOG 32 (# of elements)	30.1	30.1	30.1
DIFFERENCE	+1.6	+2.8	

ARRAY GAIN

MRA SNR	38.8	49.6	11.4
MEAN OMNI SNR	28.6	34.5	N.D.
ARRAY GAIN	10.2	15.1	
THEORETICAL AZIMUTH GAIN (at MRA)	11.7	14.2	14.0
DIFFERENCE	-1.5	+.9	

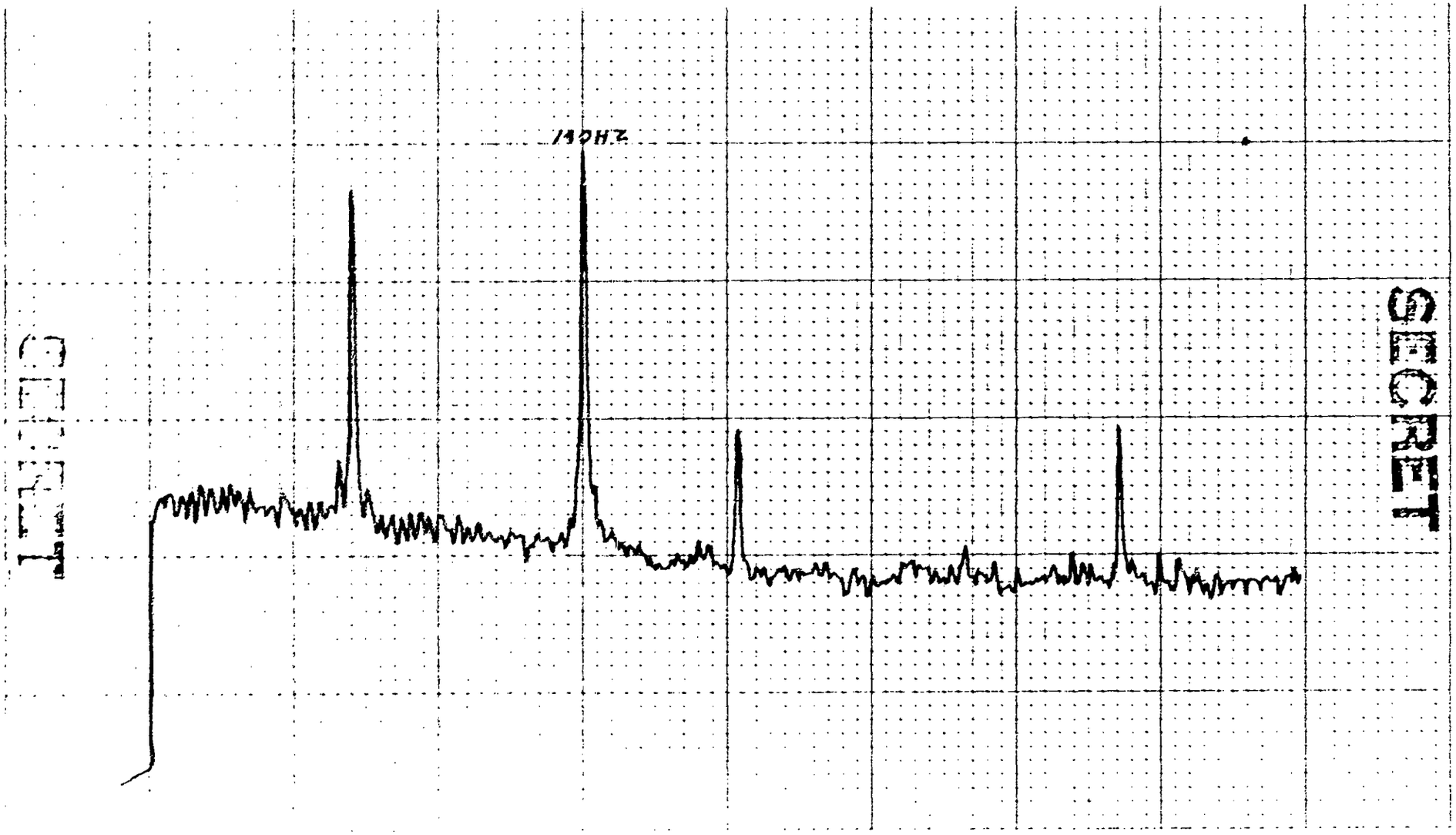
1

CONTROL: 2131 - 32 (DPI)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+44 DEG. AZ STEERING

REEL: M10
INDEX 3620

INTEGRATION TIME 320 SECS
ATTEN: -24DB
FILTER WTG: HANNING

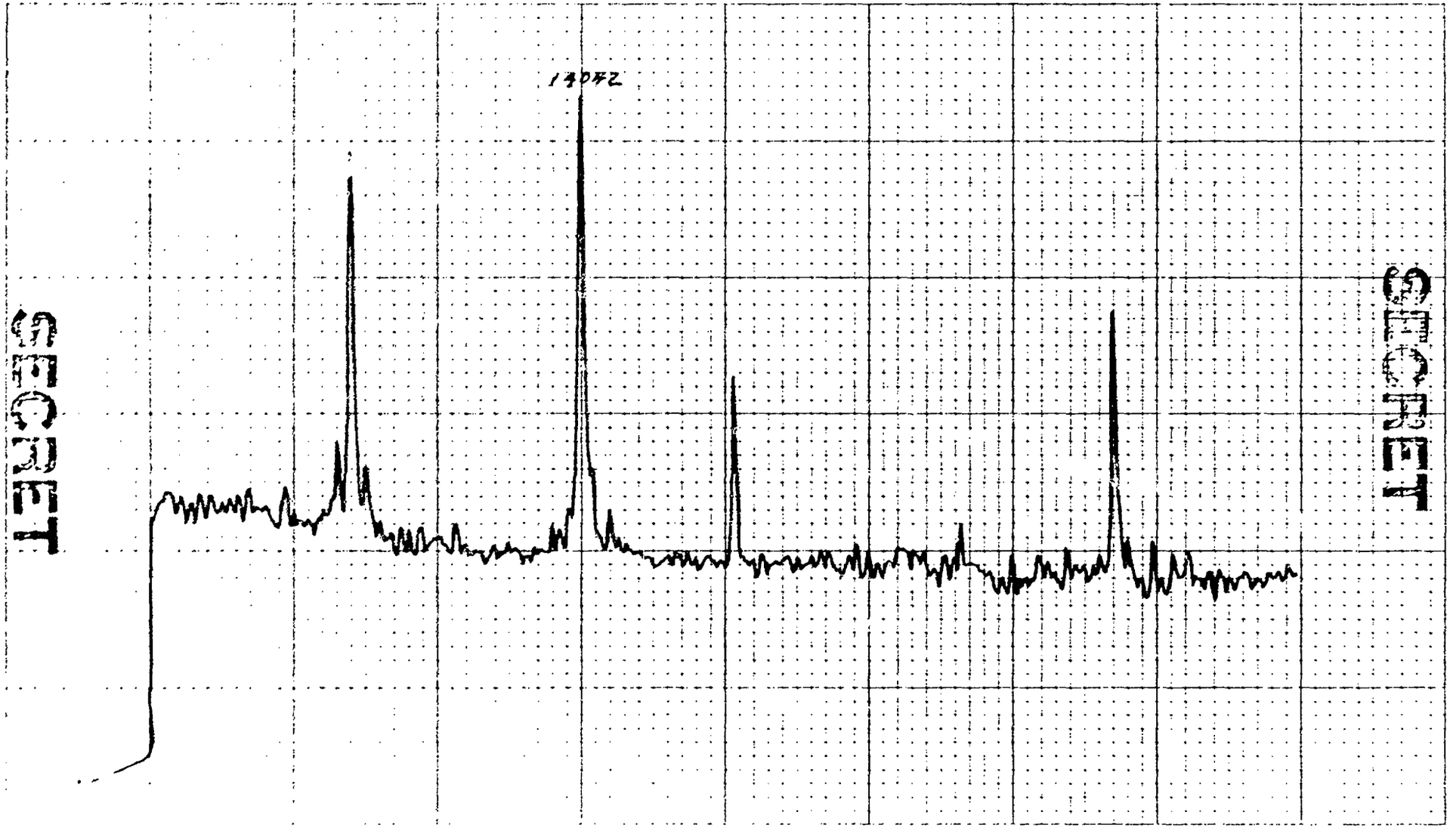


CONTROL: 2131 - 32 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 345-77-2131Z
ANALYSIS BANDWIDTH: 1/10HZ
+46 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 362c
ATTEN: -24DB



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CONTROL: 2131 - 32 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

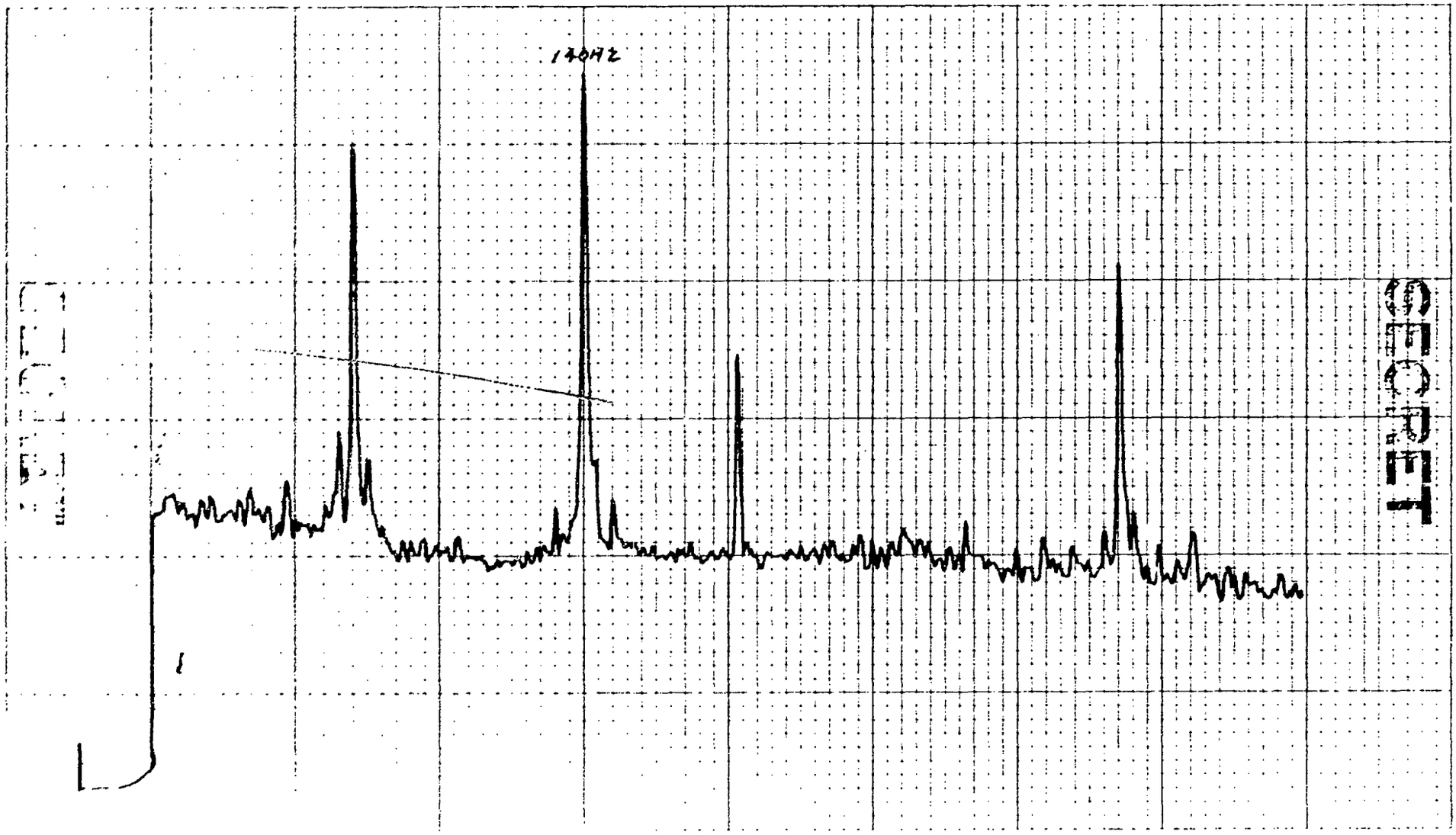
DATE OF ANALYSIS: - - -
1-26 & 29-34)
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: M10

INTEGRATION TIME 320 SECS

INDEX 3620

ATTEN: -24 DB
FILTER WTG: HANNING

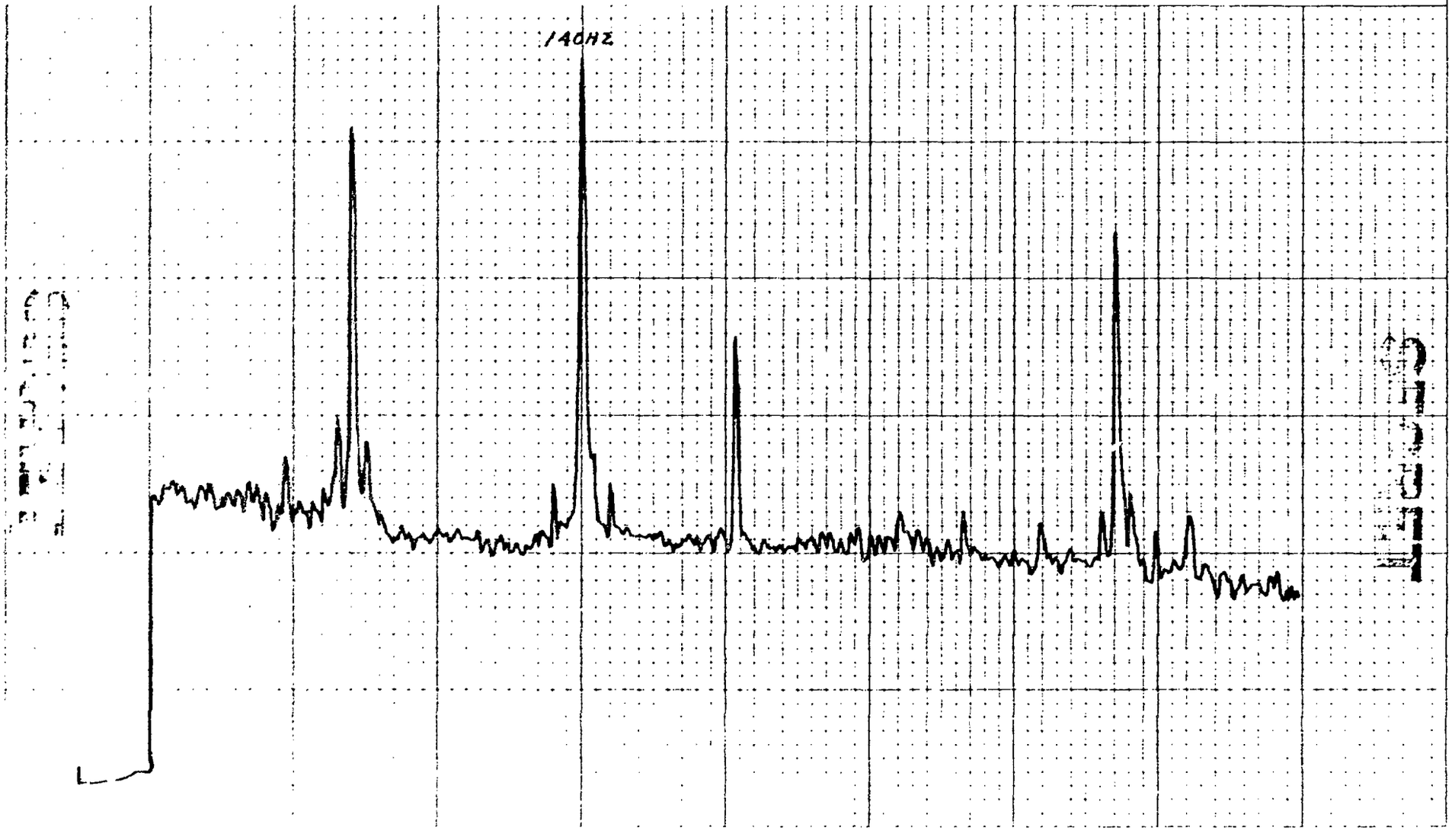


CONTROL: 2131 - 32 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE:BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -24 DB



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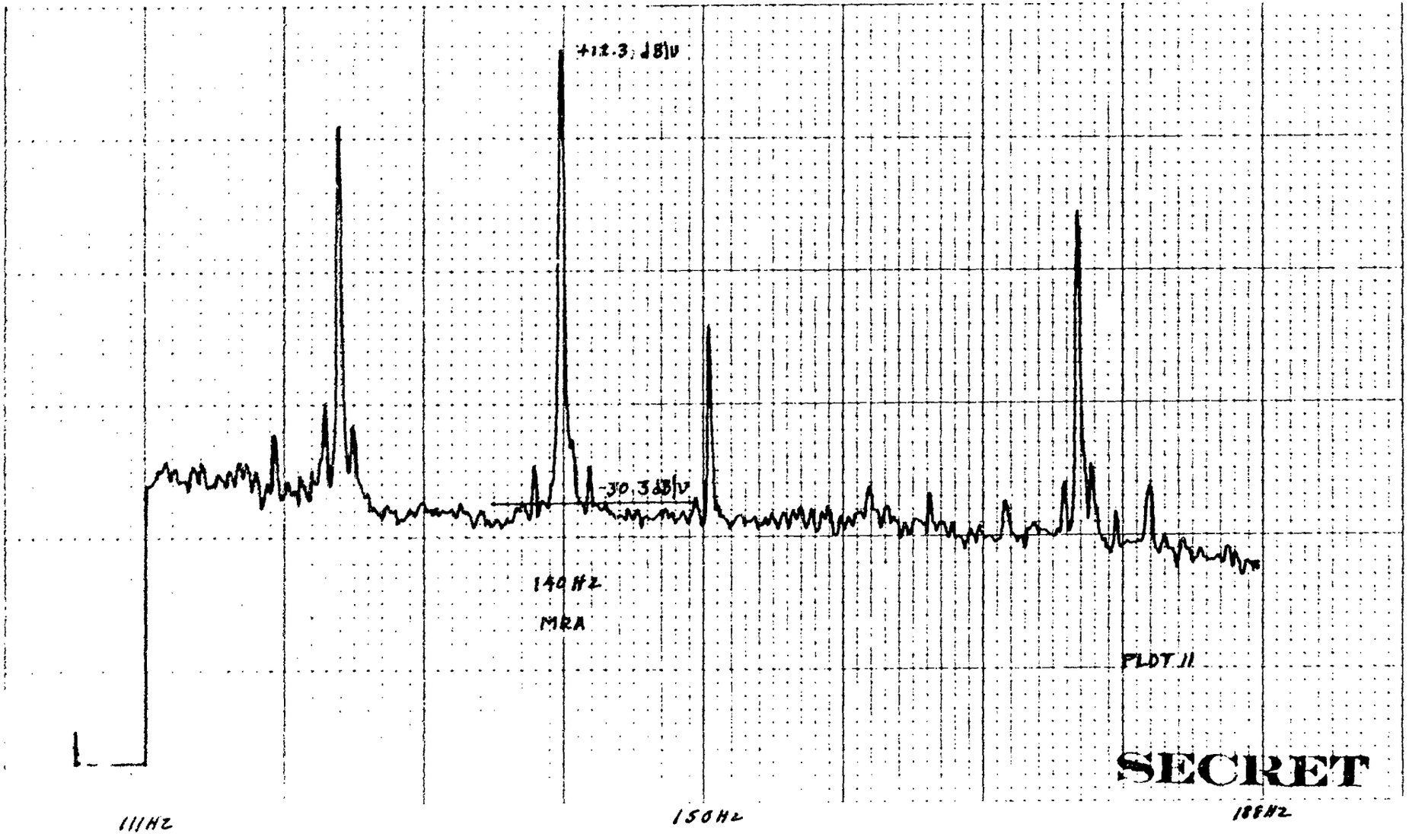
SECRET

CONTROL: 2131 - 51 (DPG)
BEAMFORMED SPECTRUM(ELEMENTS 1 TO 26 29 TO 39)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51.6 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX JC20
ATTEN: - DB



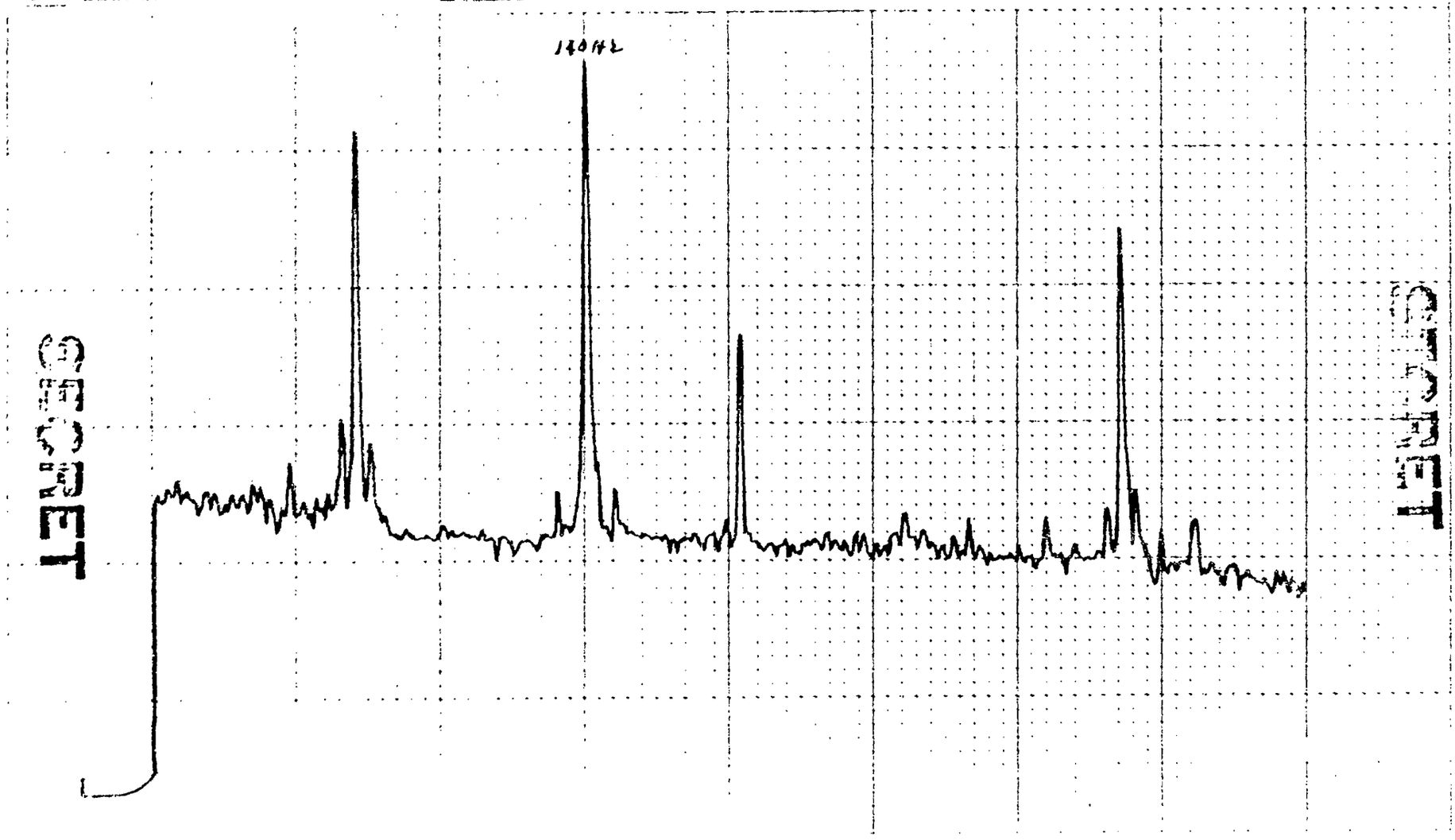
SECRET

CONTROL: 2131 - 32 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 28-34)
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX X3620
ATTEN: -24 DB



CONTROL: 2131 - 32 (289)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

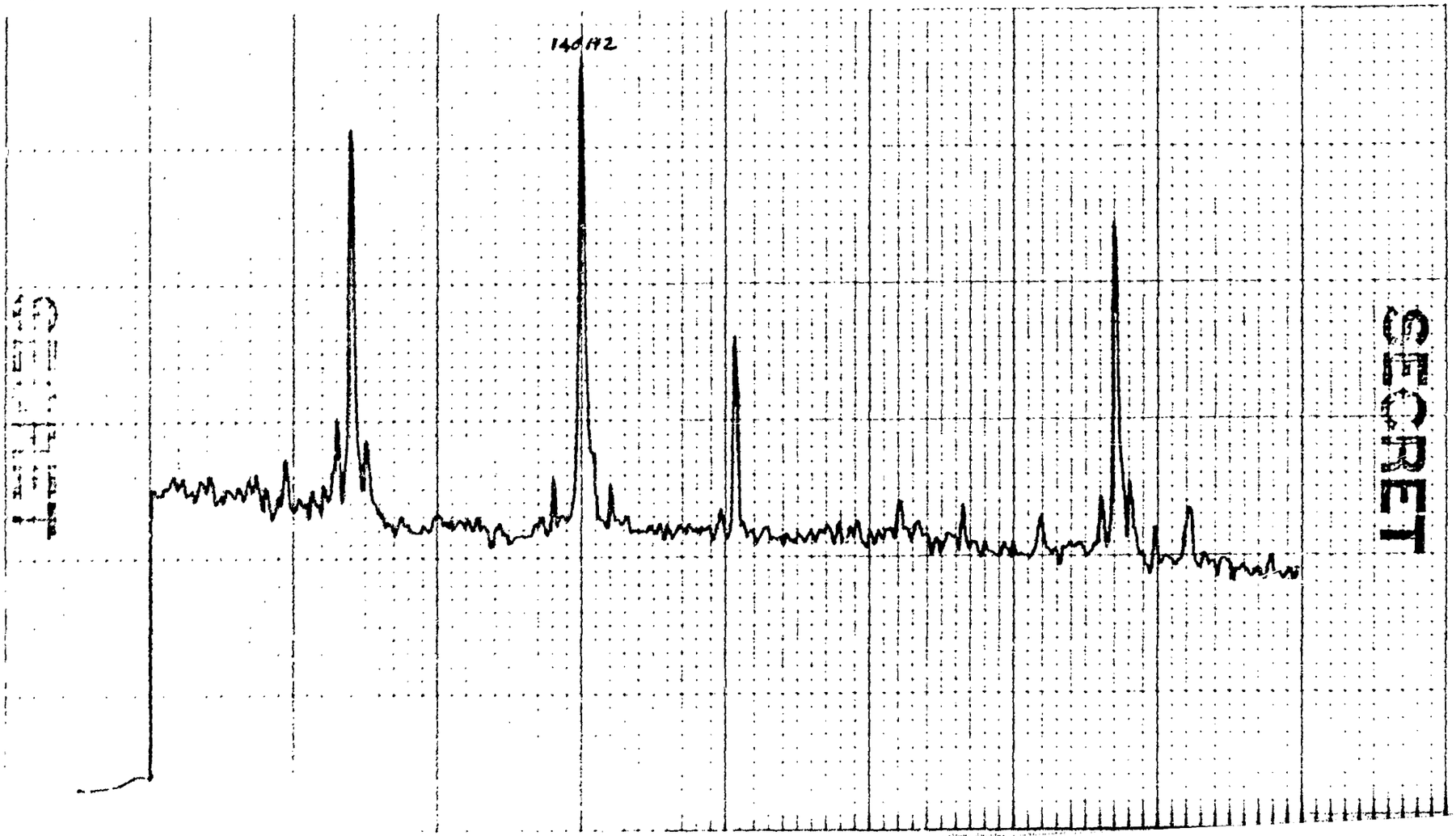
DATE OF ANALYSIS: - - -
1-26 & 28-34)
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: 410

INDEX 3620

INTEGRATION TIME 320 SECS

ATTEN: -24 DB
FILTER WTG: HANNING



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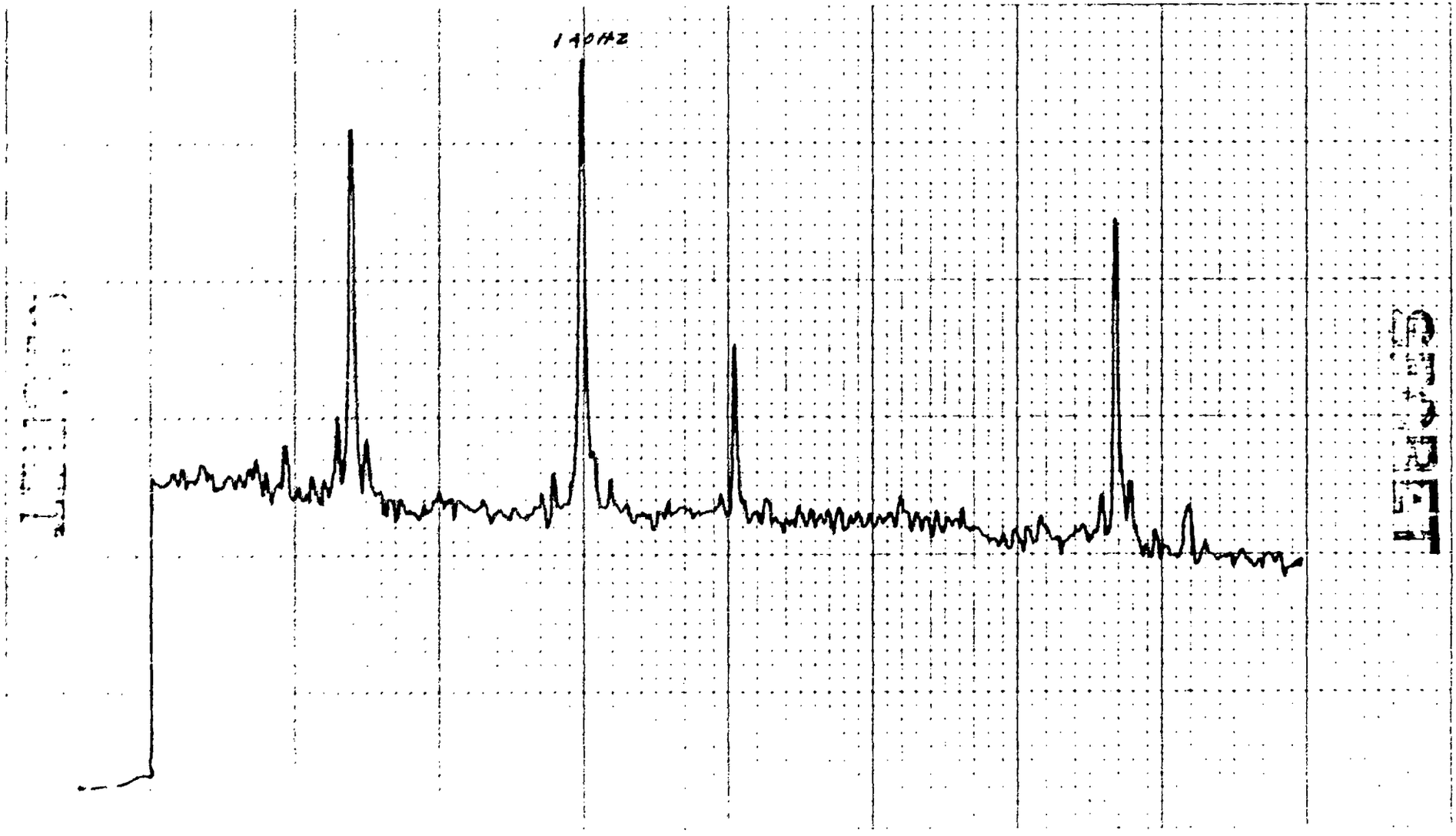
CONTROL: 2131 - 32 (DPG)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-34)
DATE/TIME: 345-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: M10
INDEX 3626

INTEGRATION TIME 320 SECS
ATTEN: -24 DB
FILTER WTG: HANNING

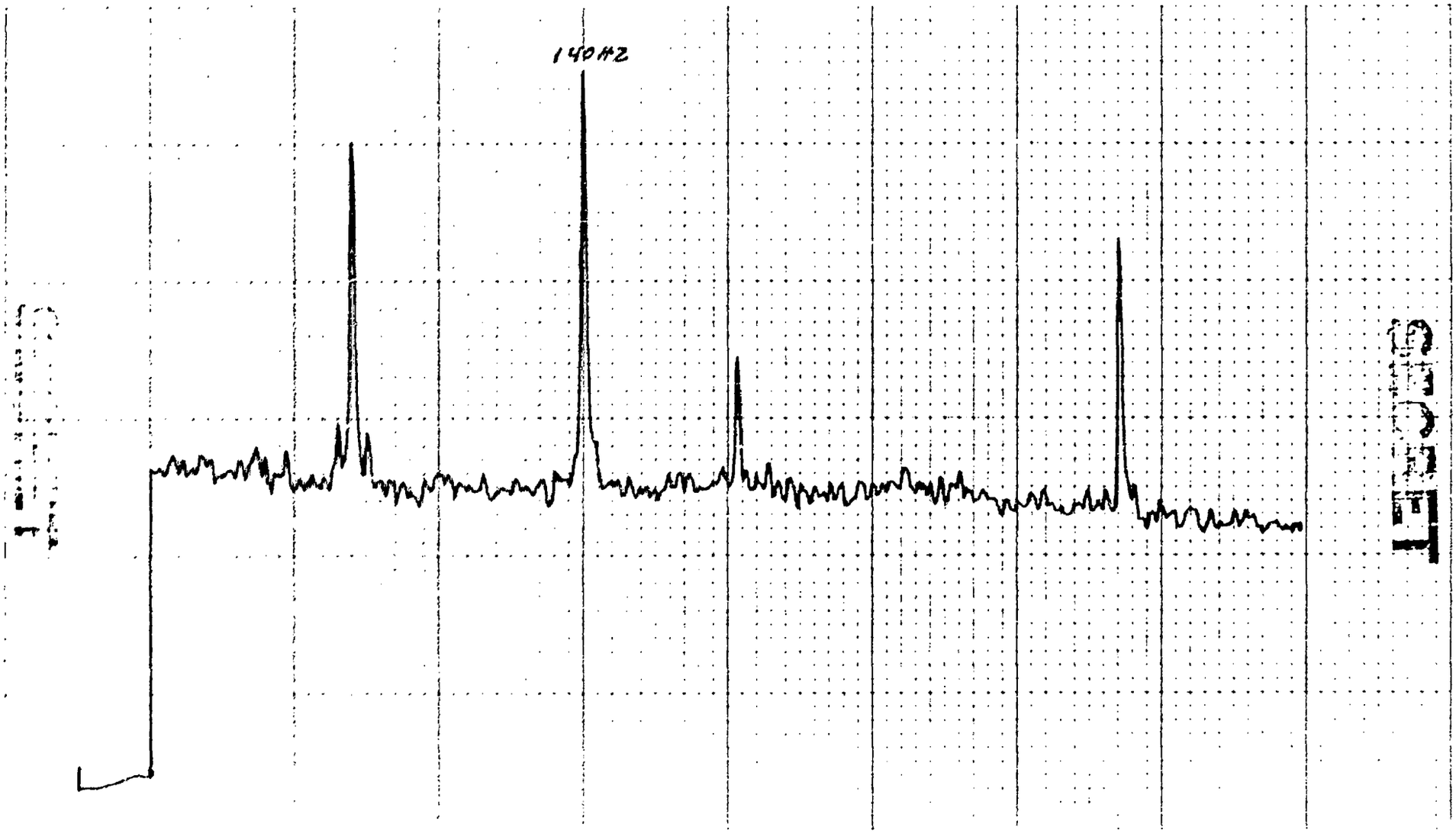


CONTROL: 2131 - 32 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: 110
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3630
ATTEN: -24 DB

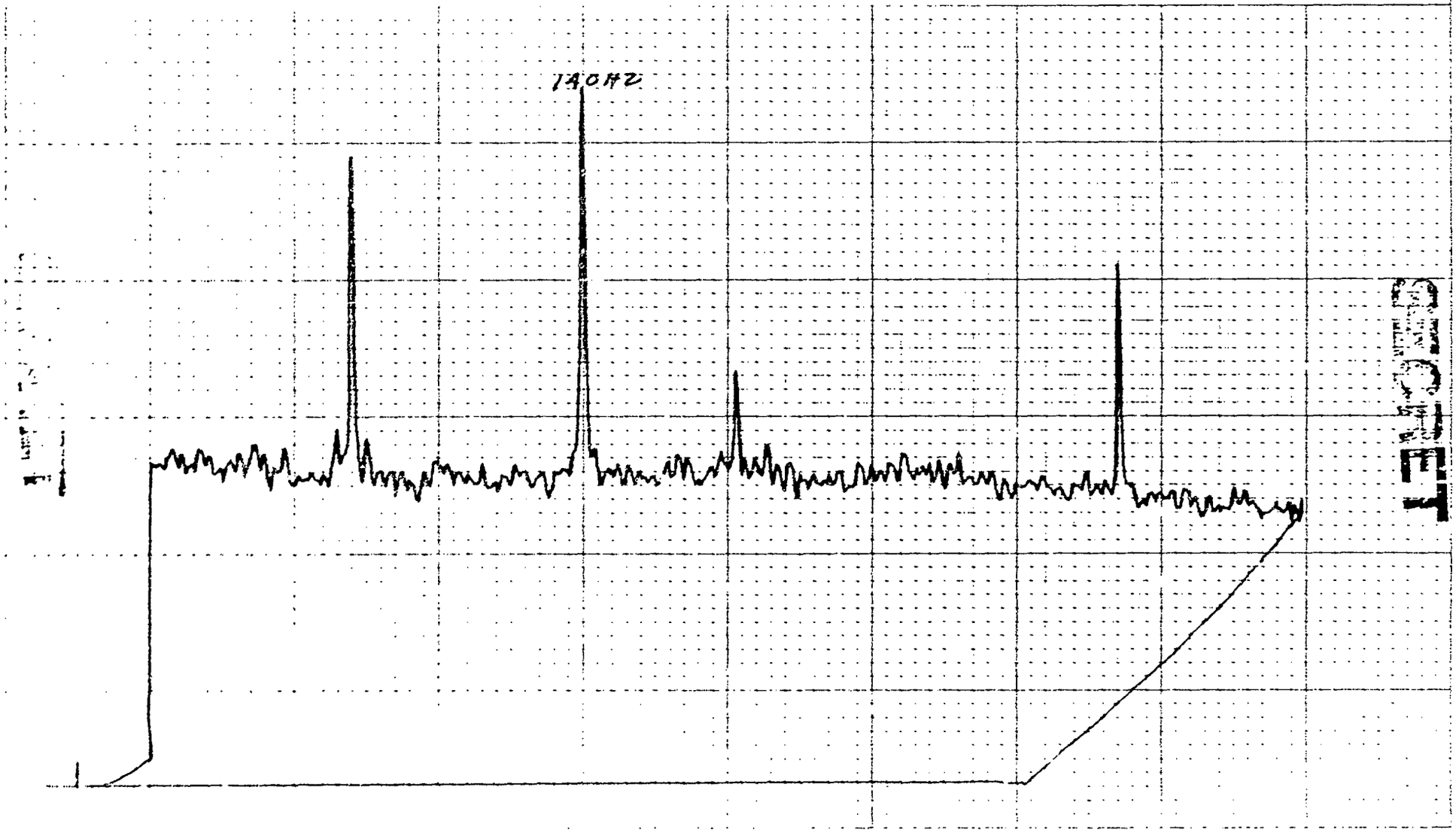


CONTROL: 2131 - 32 (DFP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE:BEARING TAKE
CENTER FREQ: 250 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -24 DB

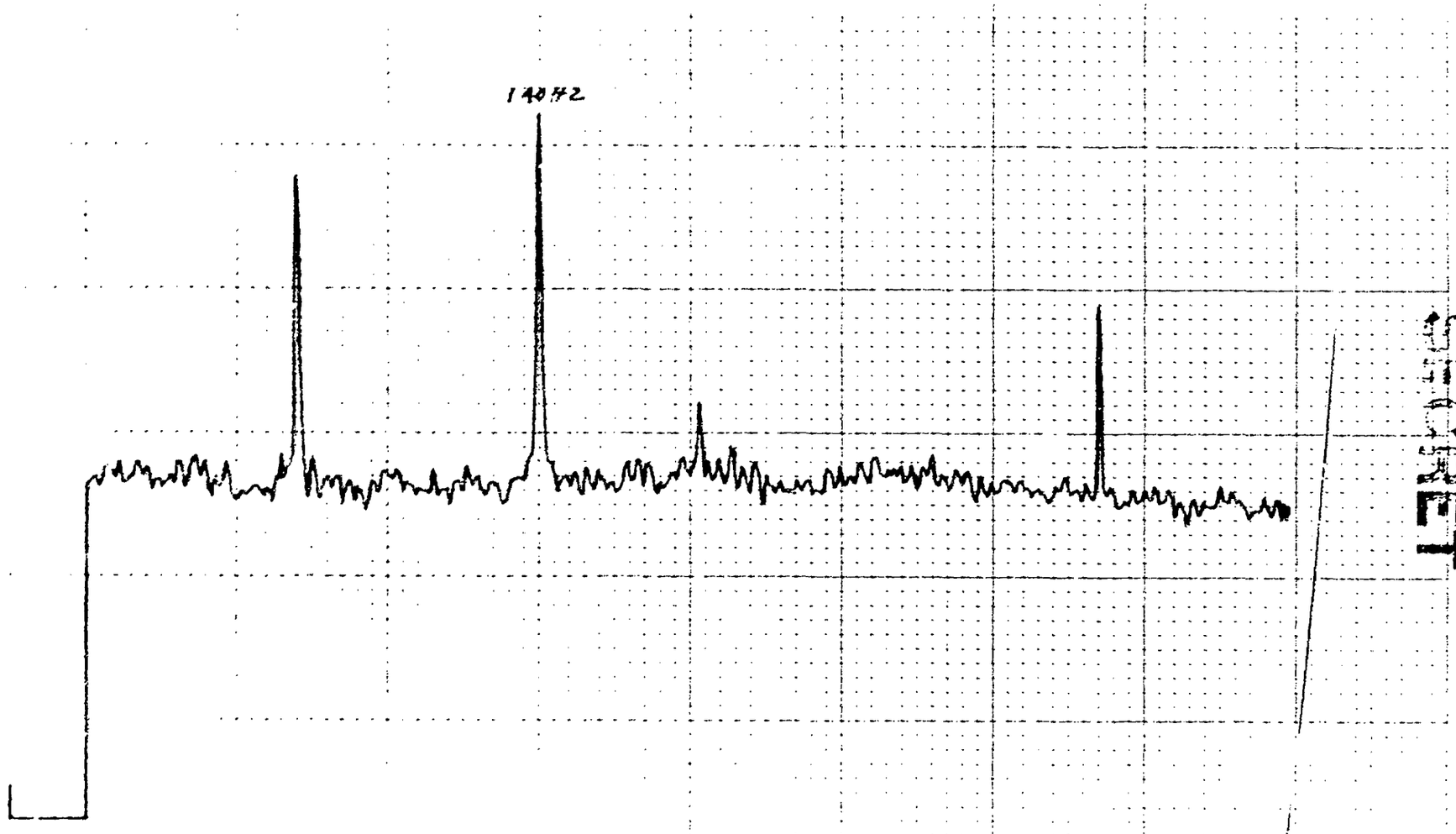


46 0703

CONTROL: 2131 - 72 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-87 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M10
INDEX 3600
INTEGRATION TIME 320 SECS
ATTEN: -24 DB
FILTER WTG: HANNING



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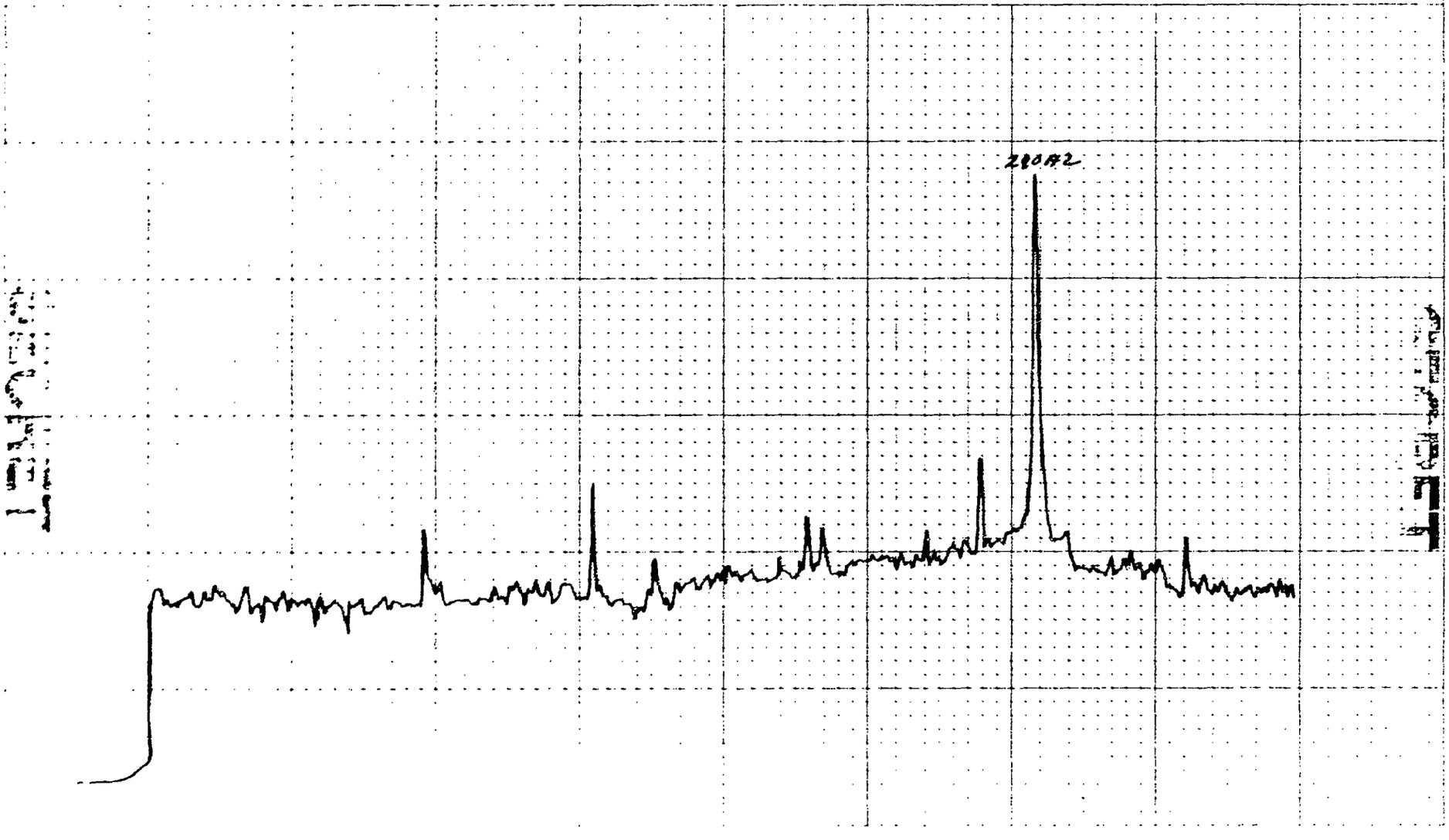
CONTROL: 2131 - 72 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131Z
ANALYSIS BANDWIDTH: 1/10HZ
+44 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3626
ATTEN: -24DB

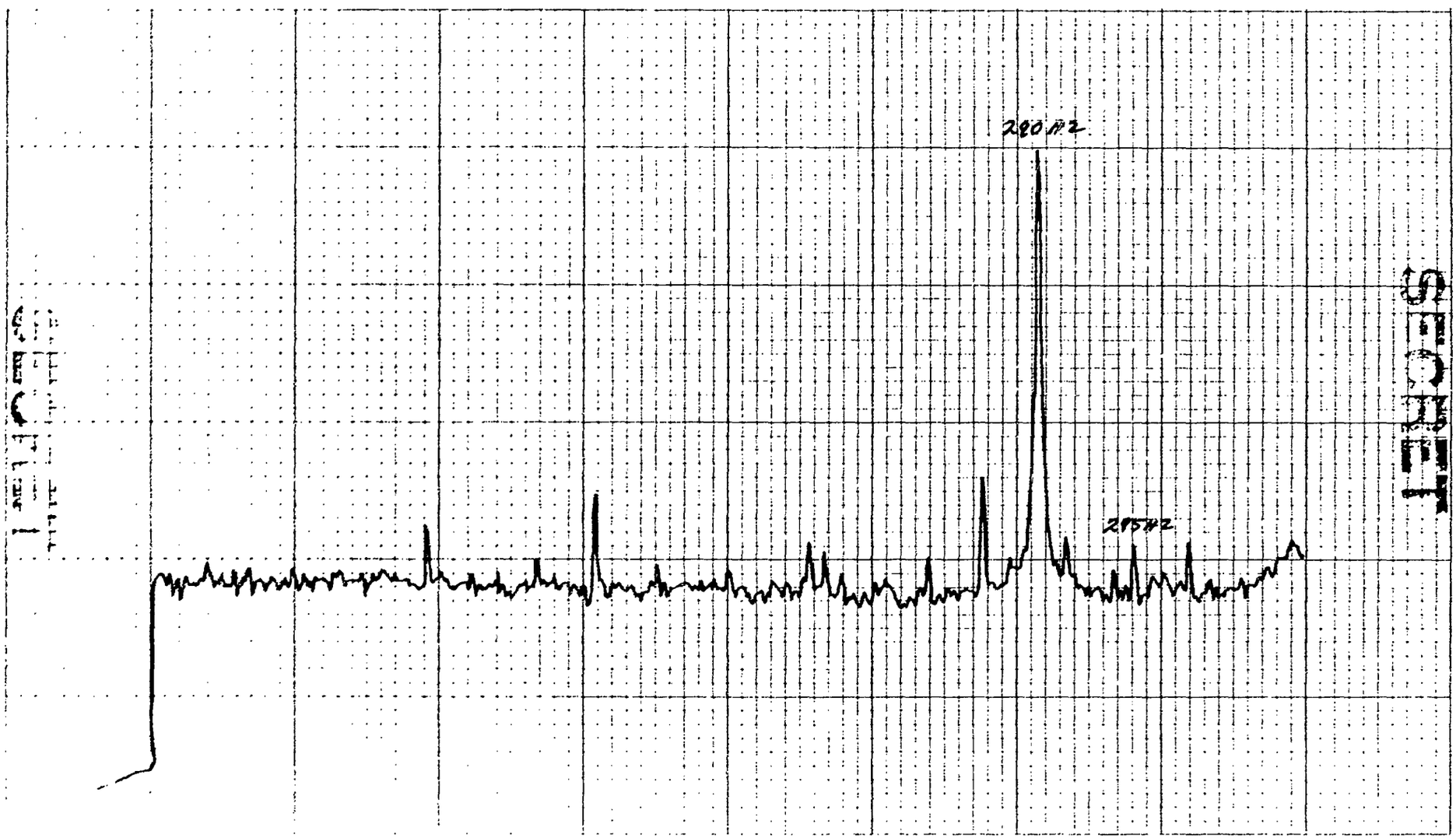


CONTROL: 2131 - 72 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+46 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -34 DB

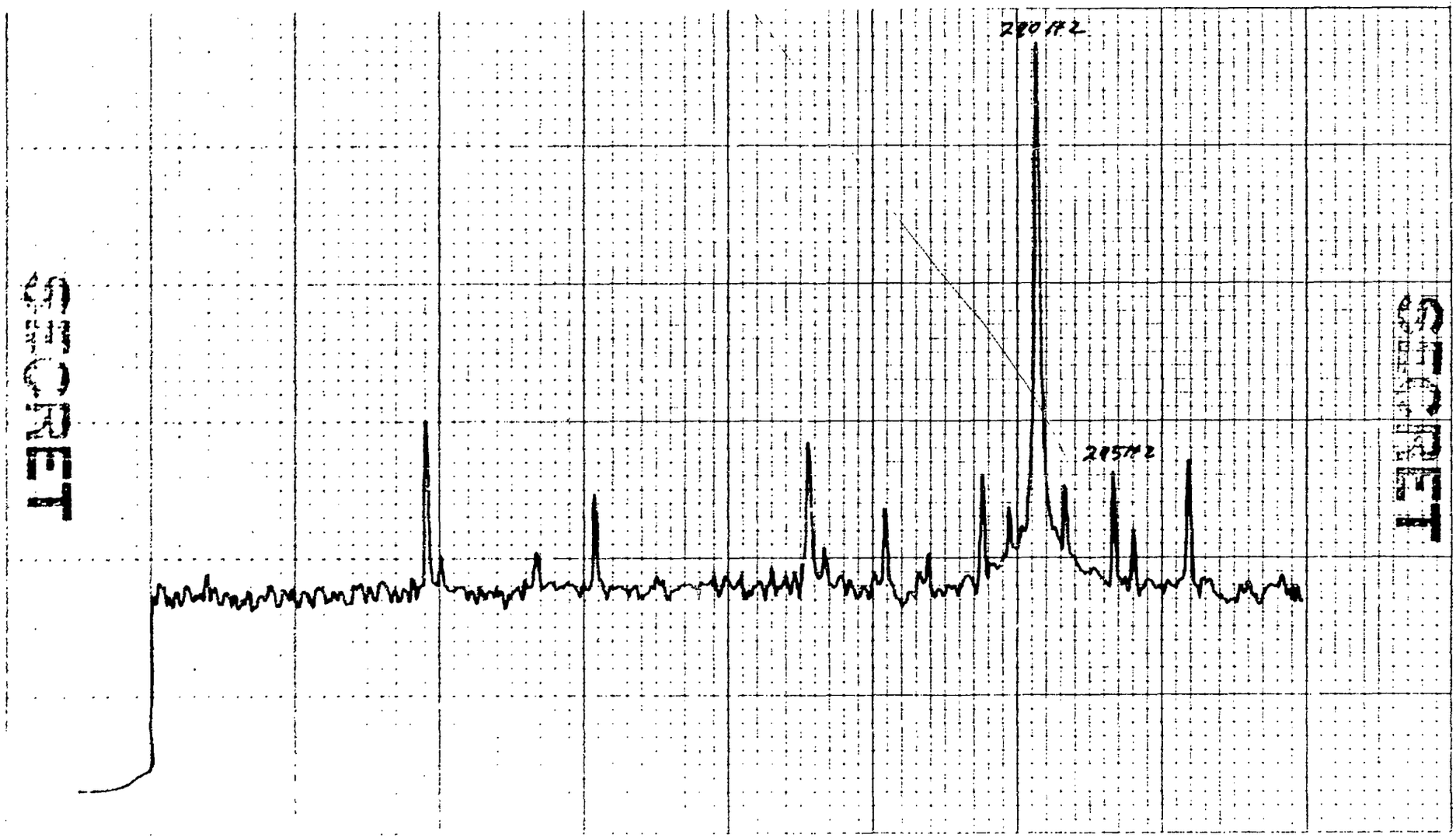


CONTROL: 2131 - 32 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -24 DB



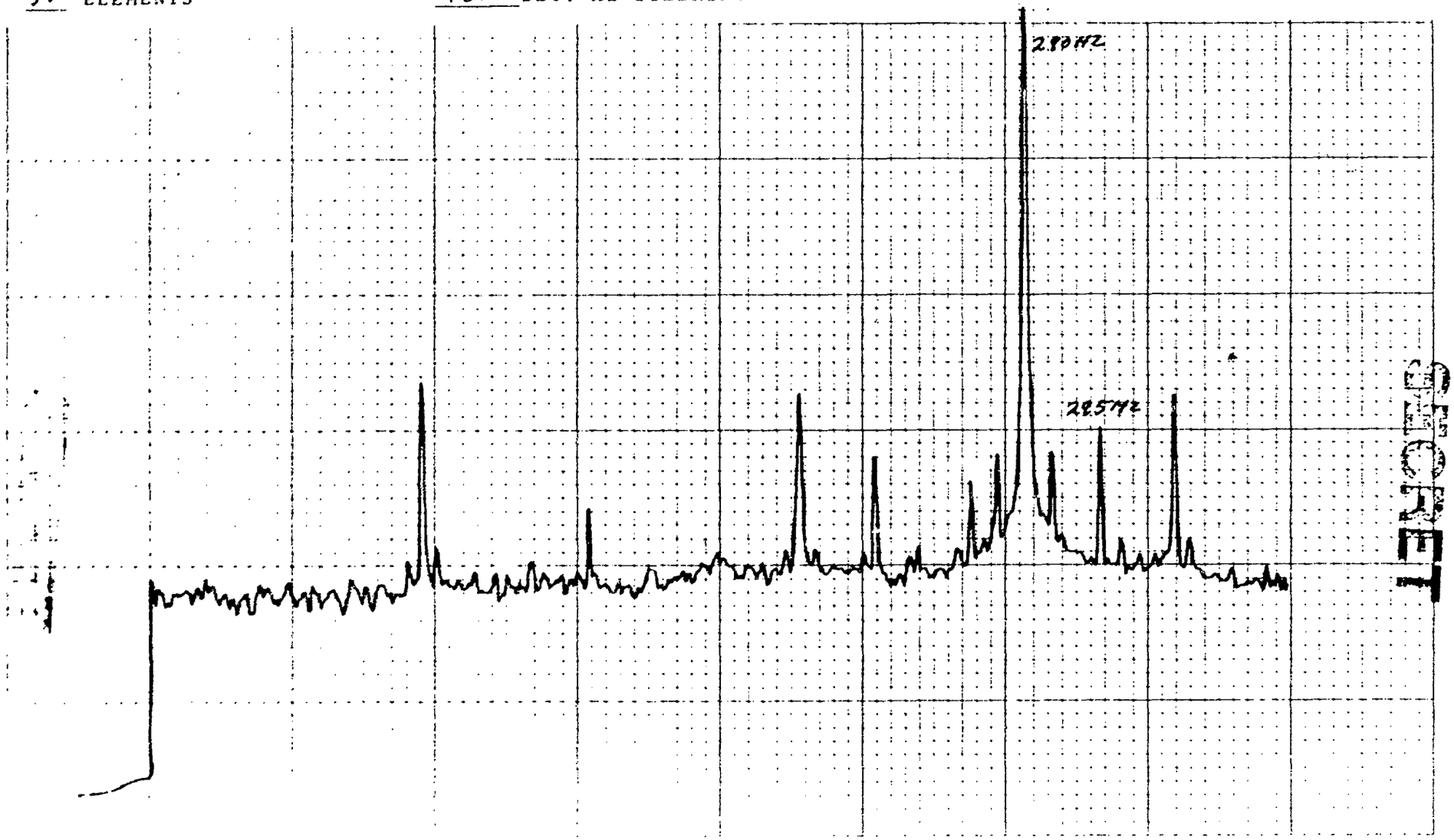
46 0703

CONTROL: 2131 - 32 (DPG)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M10
INDEX 3620

INTEGRATION TIME 320 SECS
ATTEN: -24 DB
FILTER WTG: HANNING



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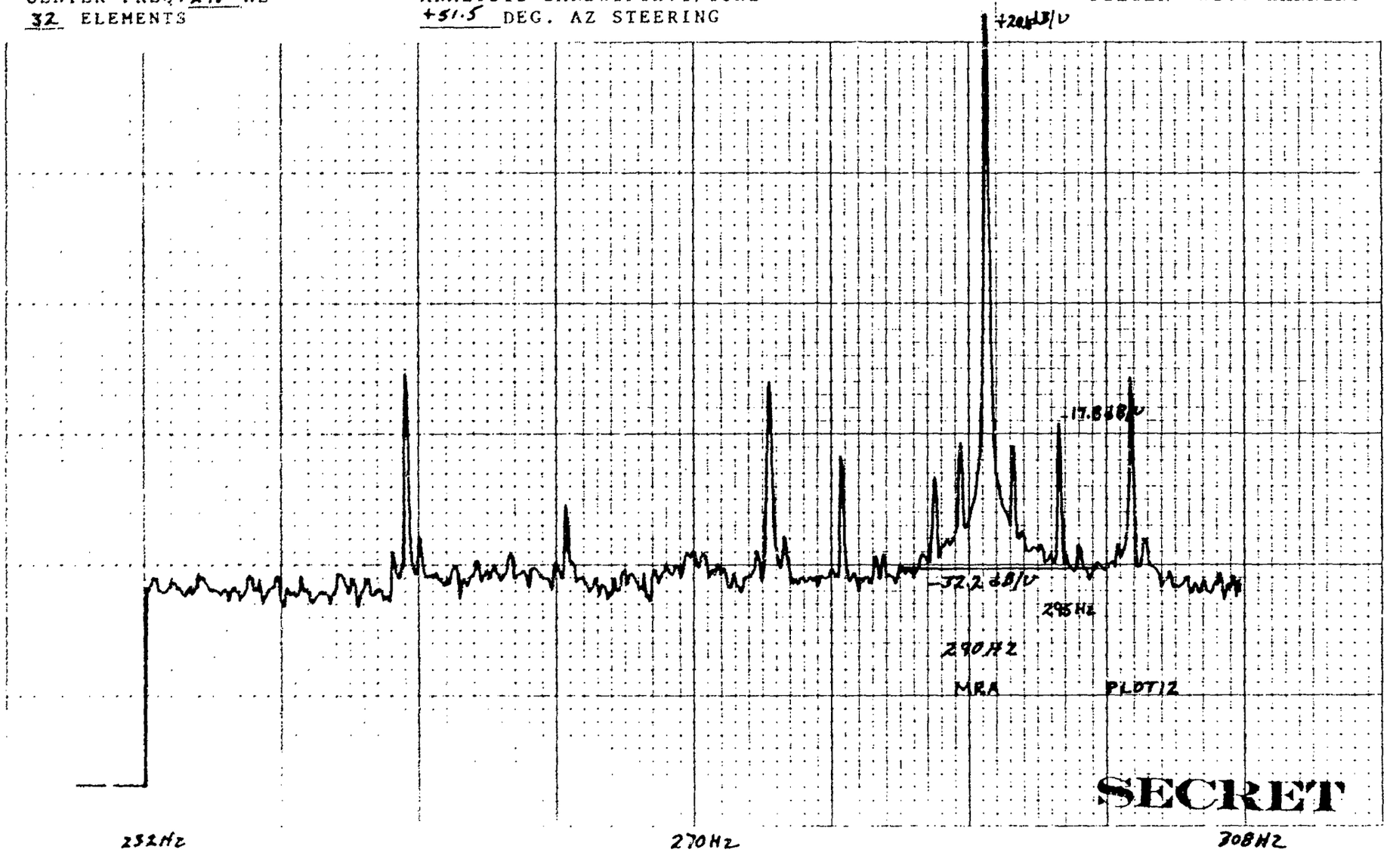
SECRET

CONTROL: 2131 - 51 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1 TO 26 29 TO 34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-15-77 -2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51.5 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: - DB



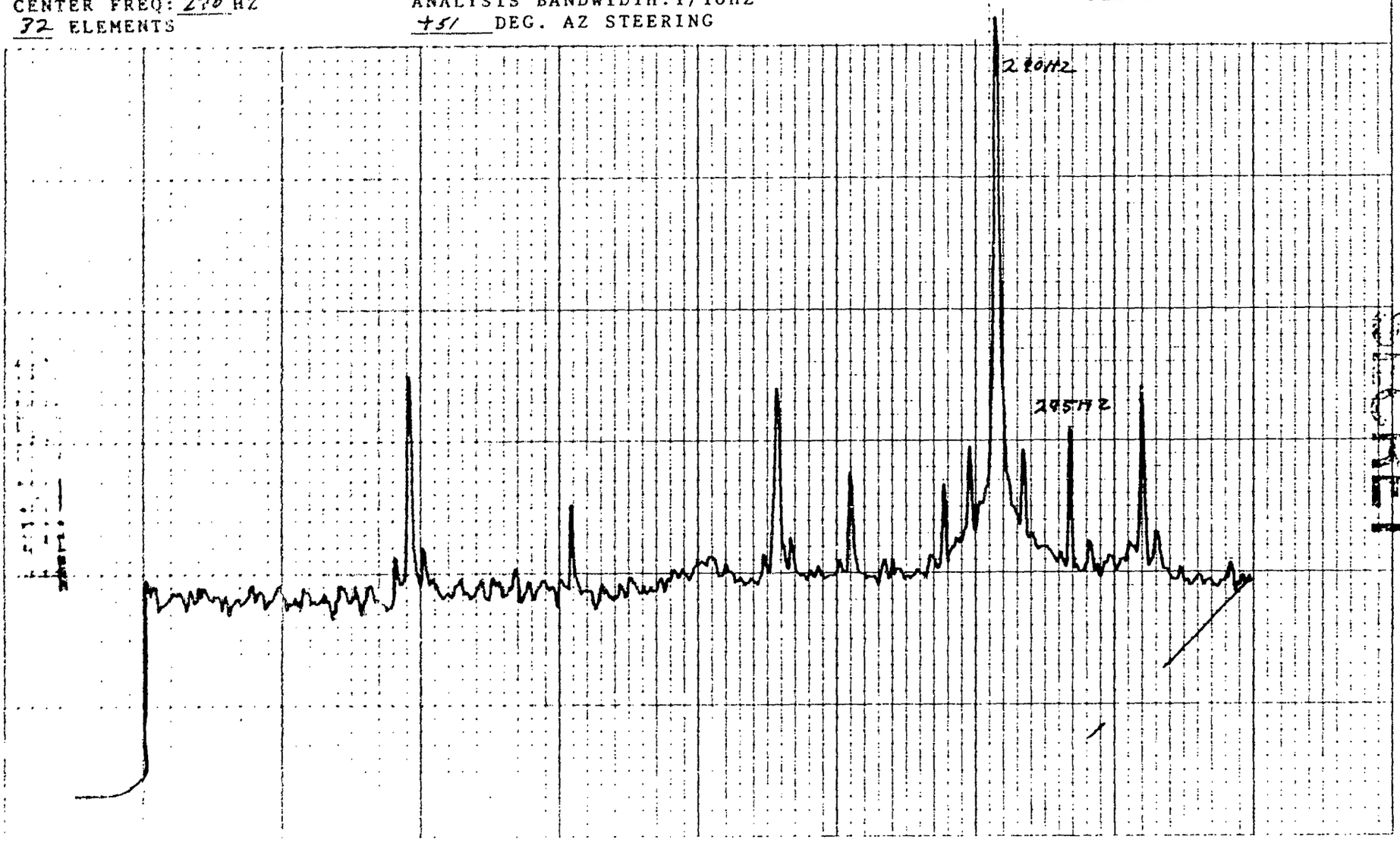
46 0703

CONTROL: 2131 - 32 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -04 DB

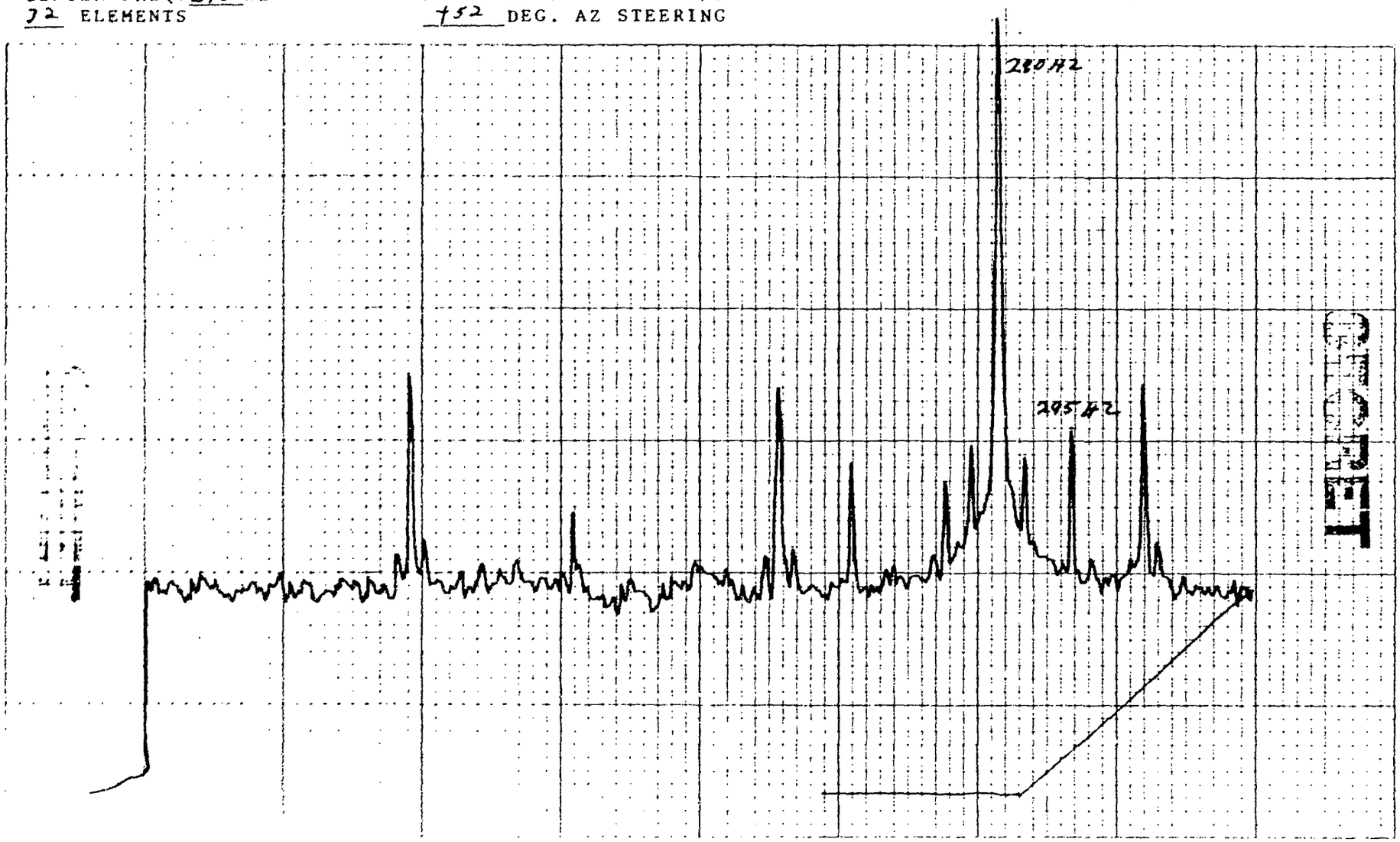


CONTROL: 2131 - 32 (399)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: 1410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -24 DB

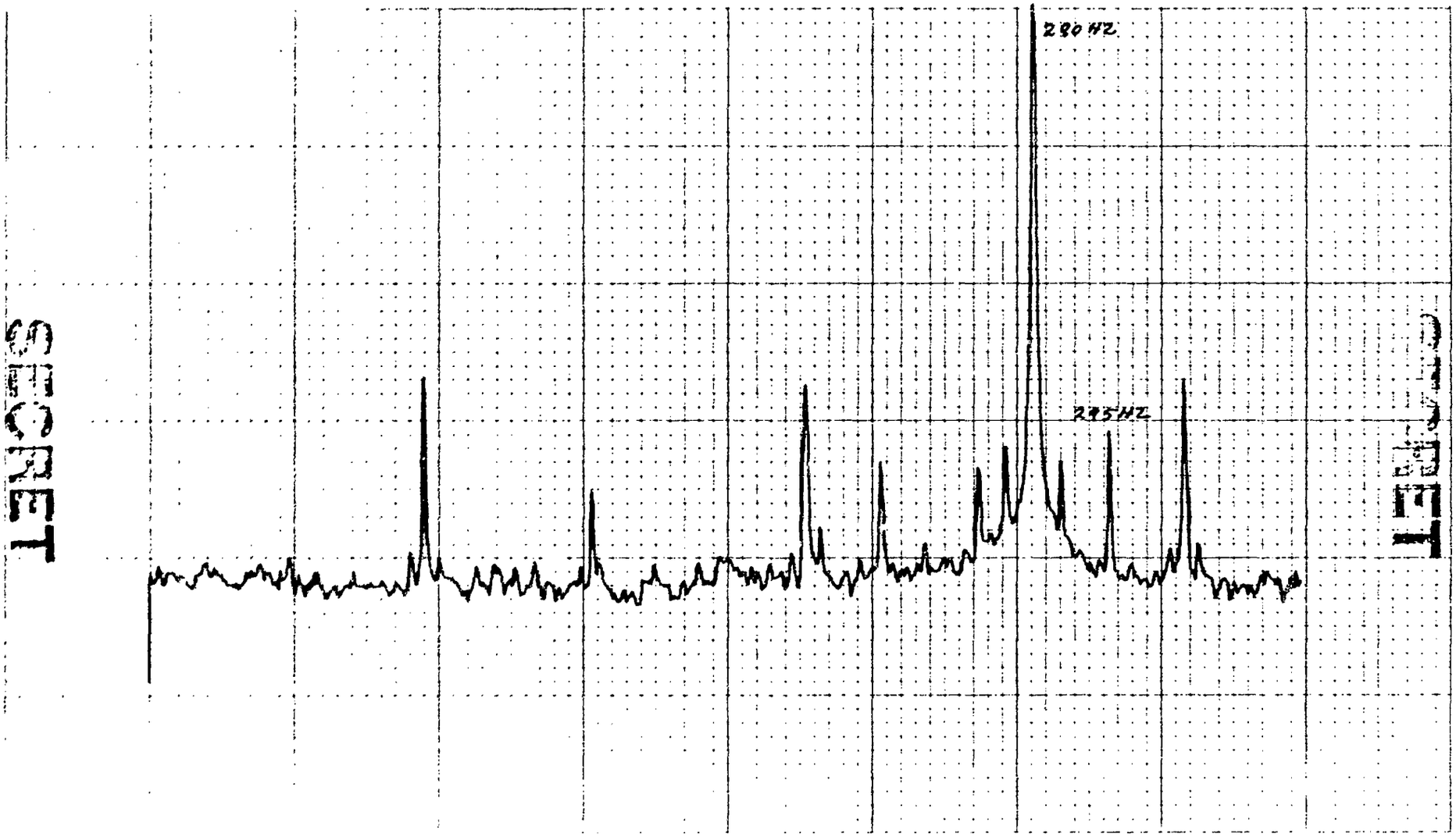


CONTROL: 2131 - 32 (209)
BEAMFORMED SPECTRUM (ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: ___ INDEX ___

INTEGRATION TIME 320 SECS ATTEN: ___ DB
FILTER WTG: HANNING

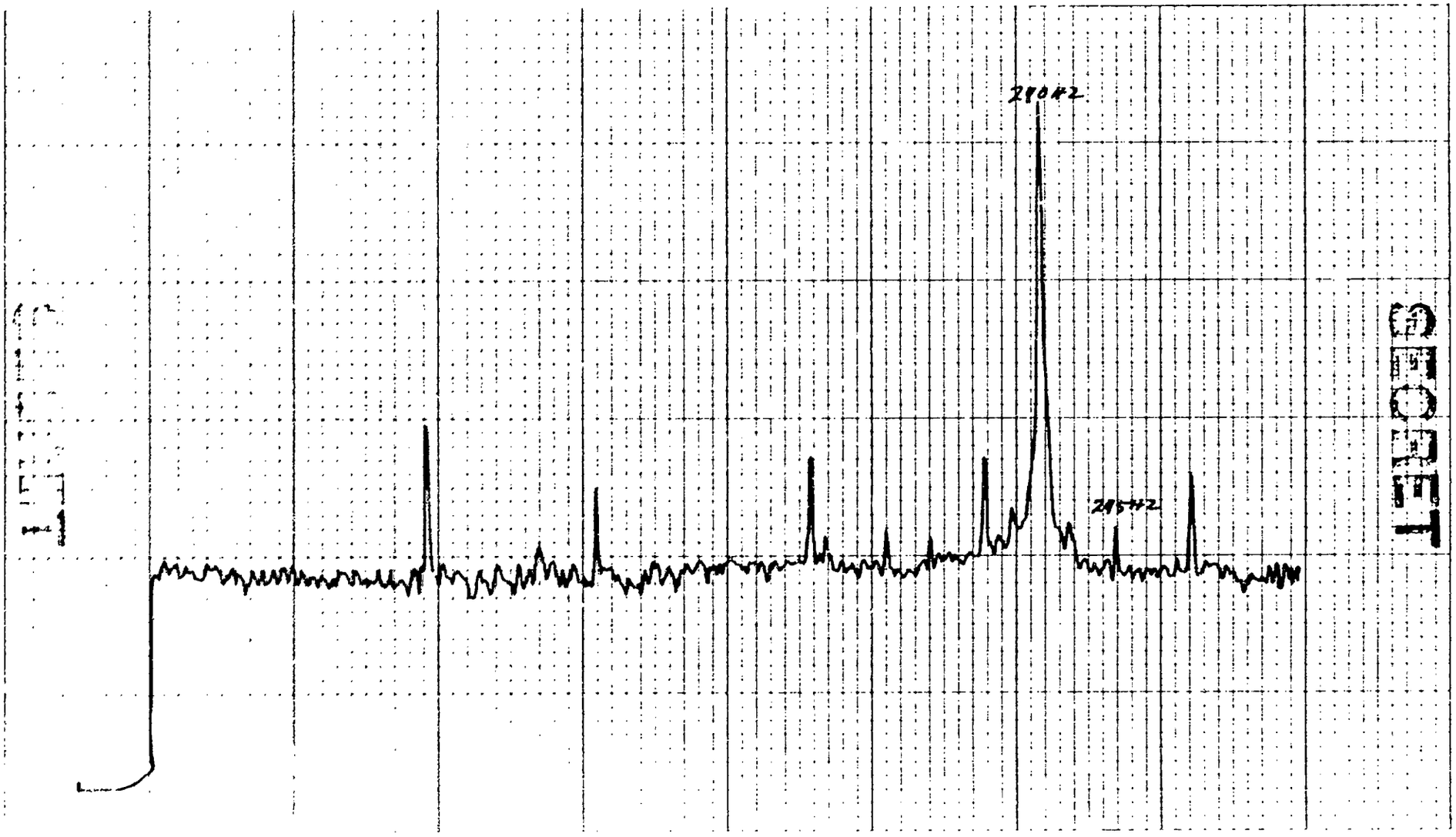


CONTROL: 2131 - 32 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

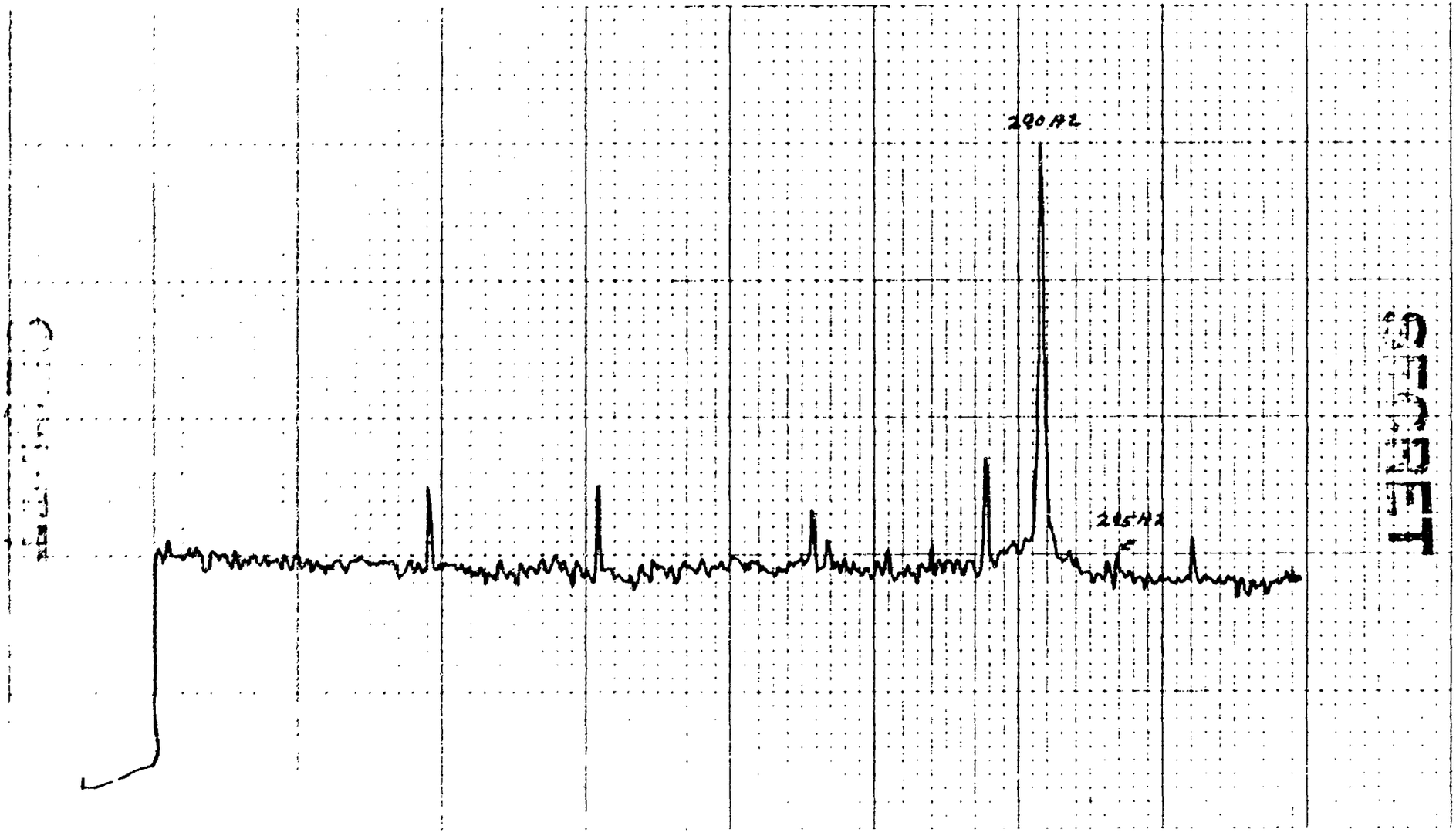
INDEX 3620
ATTEN: -24 DB



CONTROL: 2131 - 32 (789)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
72 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M10
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: -24 DB
FILTER WTG: HANNING

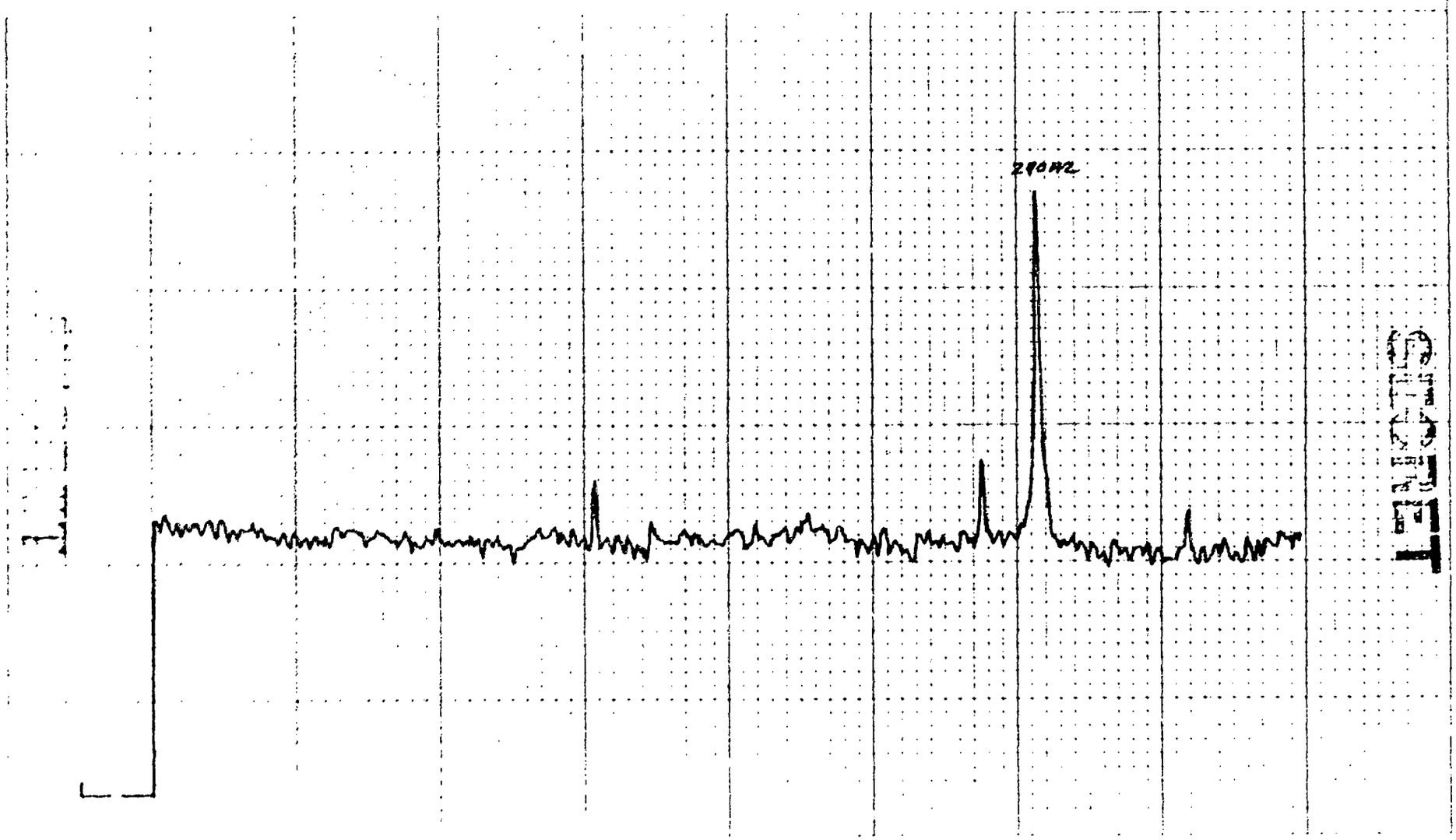


46 0703

CONTROL: 2131 - 32 (DCP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-34)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
32 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M10
INDEX 3600
INTEGRATION TIME 320 SECS
ATTEN: -24 DB
FILTER WTG: HANNING



SIGNAL LEVEL AND SNR CALCULATIONS

DATA POINT 9 FREQUENCY 140 HZ NUMBER OF ELEMENTS 51

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-23.6	
MCPS-32 CAL. CORRECTION	+10	-13.6	
BEAMFORMER GAIN	+30	+16.4	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .2	+16.6	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-69.2	
MCPS-32 CAL. CORRECTION	+10	-59.2	
BEAMFORMER GAIN	+30	-29.2	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+16.4	
SIGNAL LEVEL FOR SNR	-29.2	45.6	
PROCESSOR CORRECTION	- 4.0	41.6	
MRA CORRECTION	+ .2	41.8	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	33.6	SNR 1 HZ BAND

SECTION 13

SIGNAL LEVEL AND SNR
CALCULATIONS

DATA POINT 9 FREQUENCY 290 HZ NUMBER OF ELEMENTS 51

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-18.2	
MCPS-32 CAL. CORRECTION	+10	-8.2	
BEAMFORMER GAIN	+30	+21.8	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .8	+22.6	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-71.4	
MCPS-32 CAL. CORRECTION	+10	-61.4	
BEAMFORMER GAIN	+30	-31.4	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		+21.8	
SIGNAL LEVEL FOR SNR	-31.4	53.2	
PROCESSOR CORRECTION	-4.0	49.2	
MRA CORRECTION	+ .8	50.0	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	41.8	SNR 1 HZ BAND

SIGNAL LEVEL AND SNR

CALCULATIONS

DATA POINT 9 FREQUENCY 295 HZ NUMBER OF ELEMENTS 51

SIGNAL LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-56.3	
MCPS-32 CAL. CORRECTION	+10	-46.3	
BEAMFORMER GAIN	+30	-16.3	SIG. LEVEL FOR SNR CALCULATIO
MRA CORRECTION	+ .8	-15.5	SIG. LEVEL FOR SIGNAL GAIN

NOISE LEVEL

MCPS-32 SIGNAL LEVEL INDICATED		-71.4	
MCPS-32 CAL. CORRECTION	+10	-61.4	
BEAMFORMER GAIN	+30	-31.4	NOISE LEVEL FOR SNR CALCULATION

SIGNAL-NOISE-RATIO

SIGNAL LEVEL FOR SNR		-16.3	
SIGNAL LEVEL FOR SNR	-31.4	15.1	
PROCESSOR CORRECTION	-4.2	10.9	
MRA CORRECTION	+ .8	11.7	SNR 1/10 HZ BAND
BANDWIDTH CONVERSION	-8.2	3.5	SNR 1 HZ BAND

DATA POINT 9

SIGNAL GAIN

	140 HZ	290HZ	295HZ
MEAN OMNI SIGNAL LEVEL	-19.4	-12.5	N.D
MRA SIGNAL LEVEL	+16.6	+22.6	-15.5
ARRAY SIGNAL GAIN	36.0	35.1	
20 LOG 51 (# of elements)	34.1	34.1	34.1
DIFFERENCE	+1.9	+1.0	

ARRAY GAIN

MRA SNR	41.8	50.0	11.7
MEAN OMNI SNR	28.6	34.5	N.D.
ARRAY GAIN	13.2	15.5	
THEORETICAL AZMUTH GAIN (at MRA)	13.6	16.0	16.2
DIFFERENCE	-.4	-.5	

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131-51 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131Z
ANALYSIS BANDWIDTH: 1/10HZ
+44 DEG. AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: -30 DB
FILTER WTG: HANNING

SECRET

SECRET

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 51 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+46 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3120
ATTEN: -70 DB

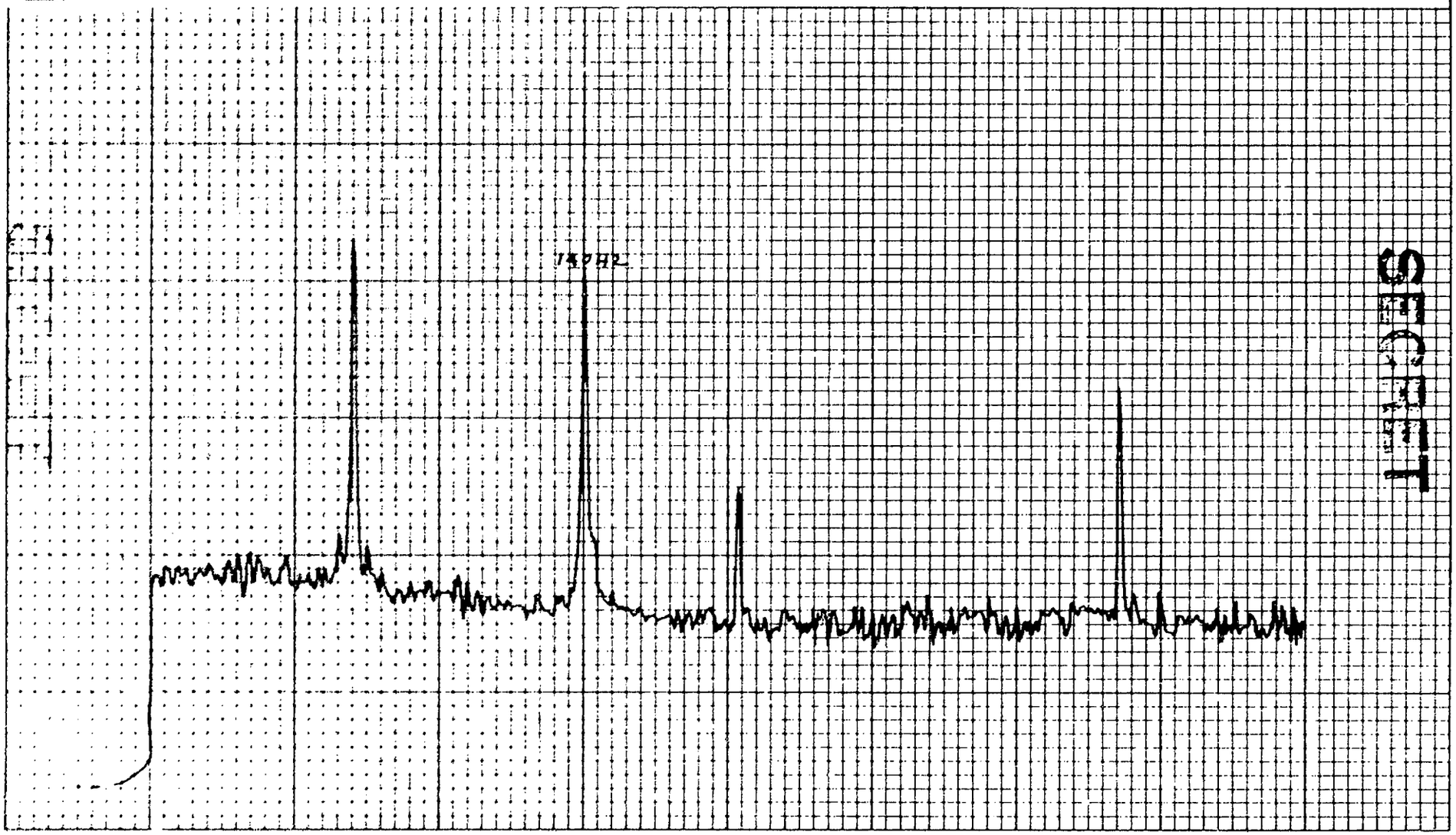


FIGURE 9

46 0703

CONTROL: 2131 - 51 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+48 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -30 DB

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

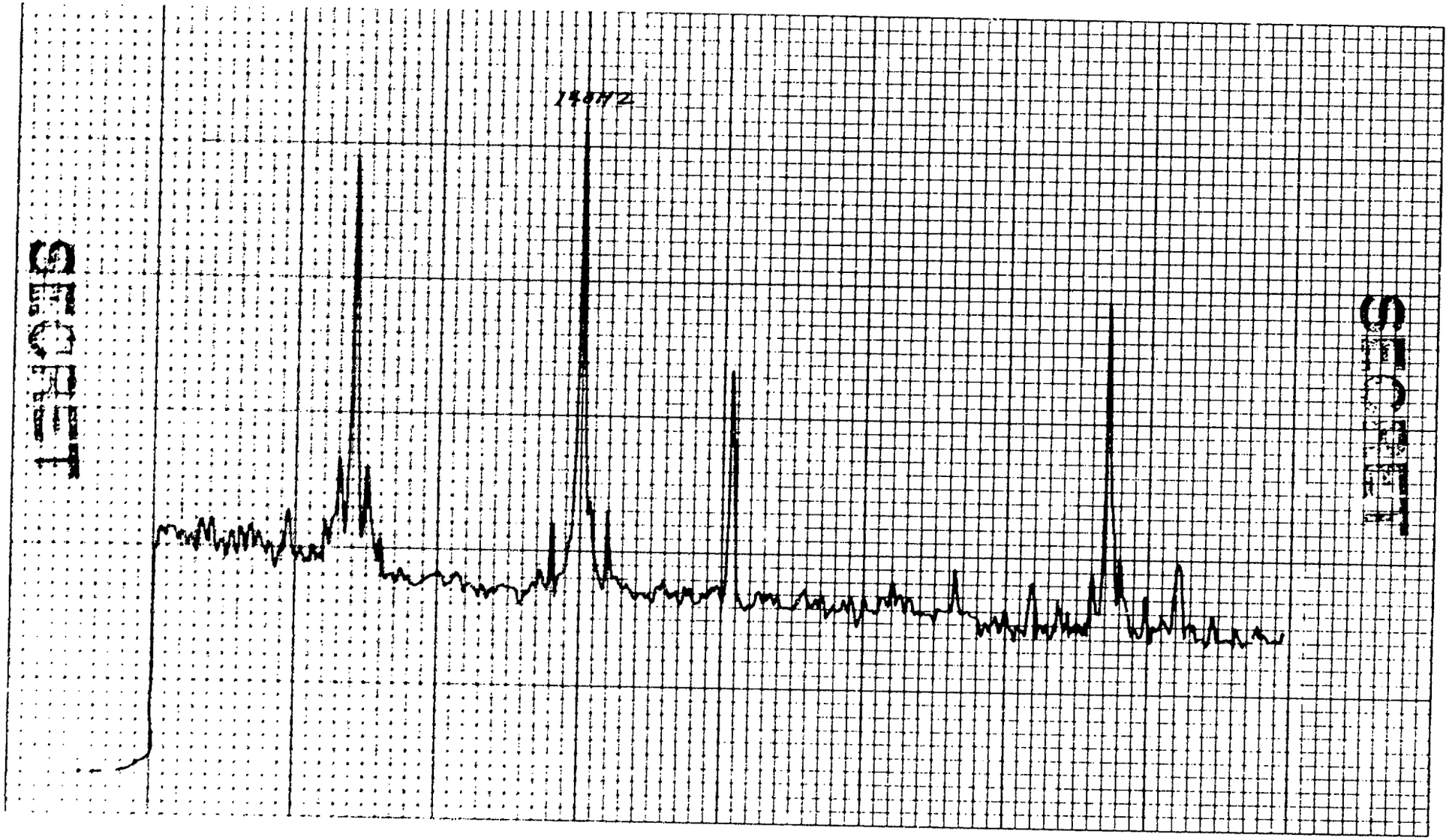
46 0703

CONTROL: 2131 - 51 (D#9)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M10 INDEX 3620

INTEGRATION TIME 320 SECS ATTEN: -30 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

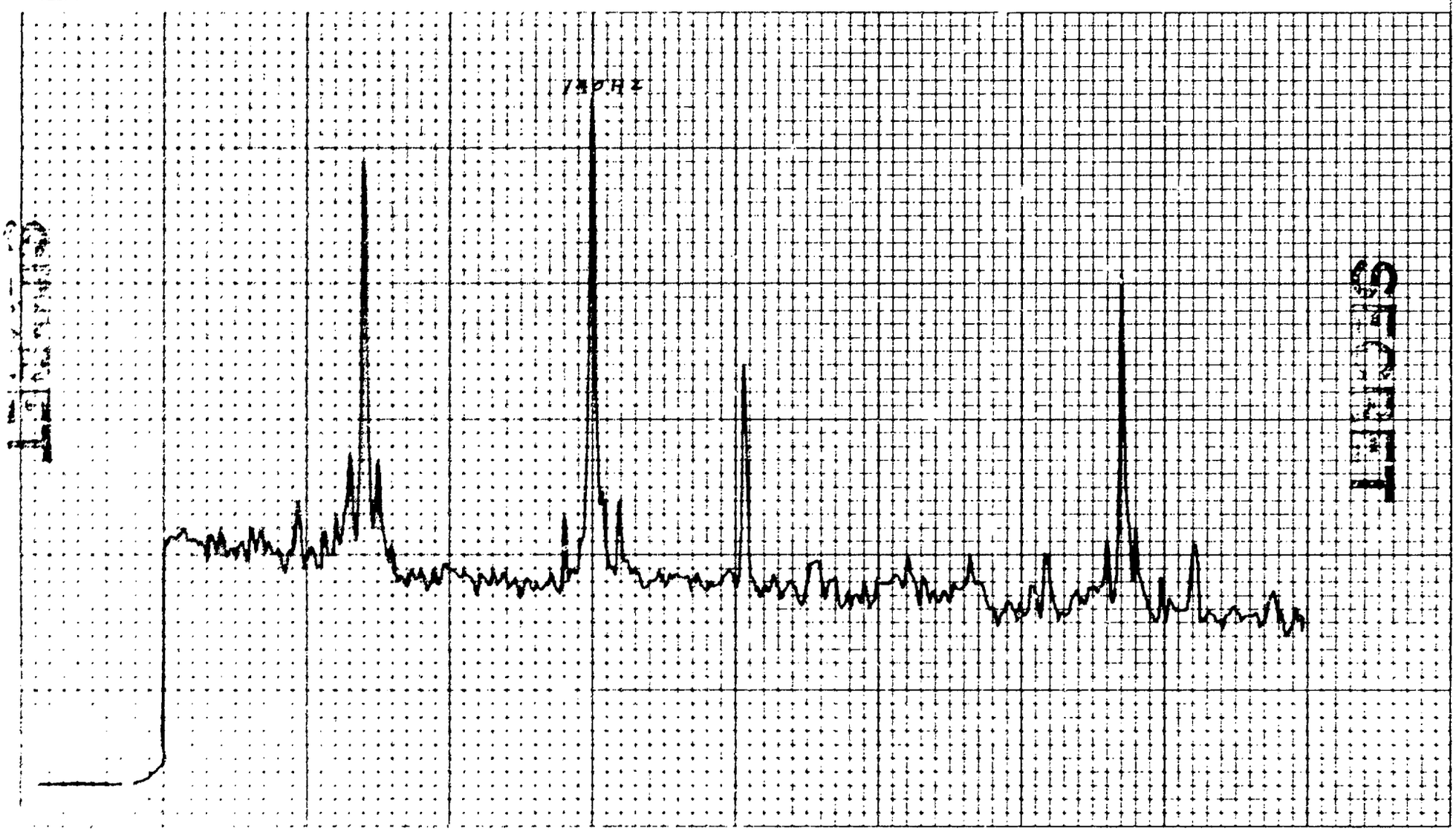
46 0703

CONTROL: 2131 - 51 (DPI)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 2131Z
ANALYSIS BANDWIDTH: 1/10HZ
+51 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -30 DB



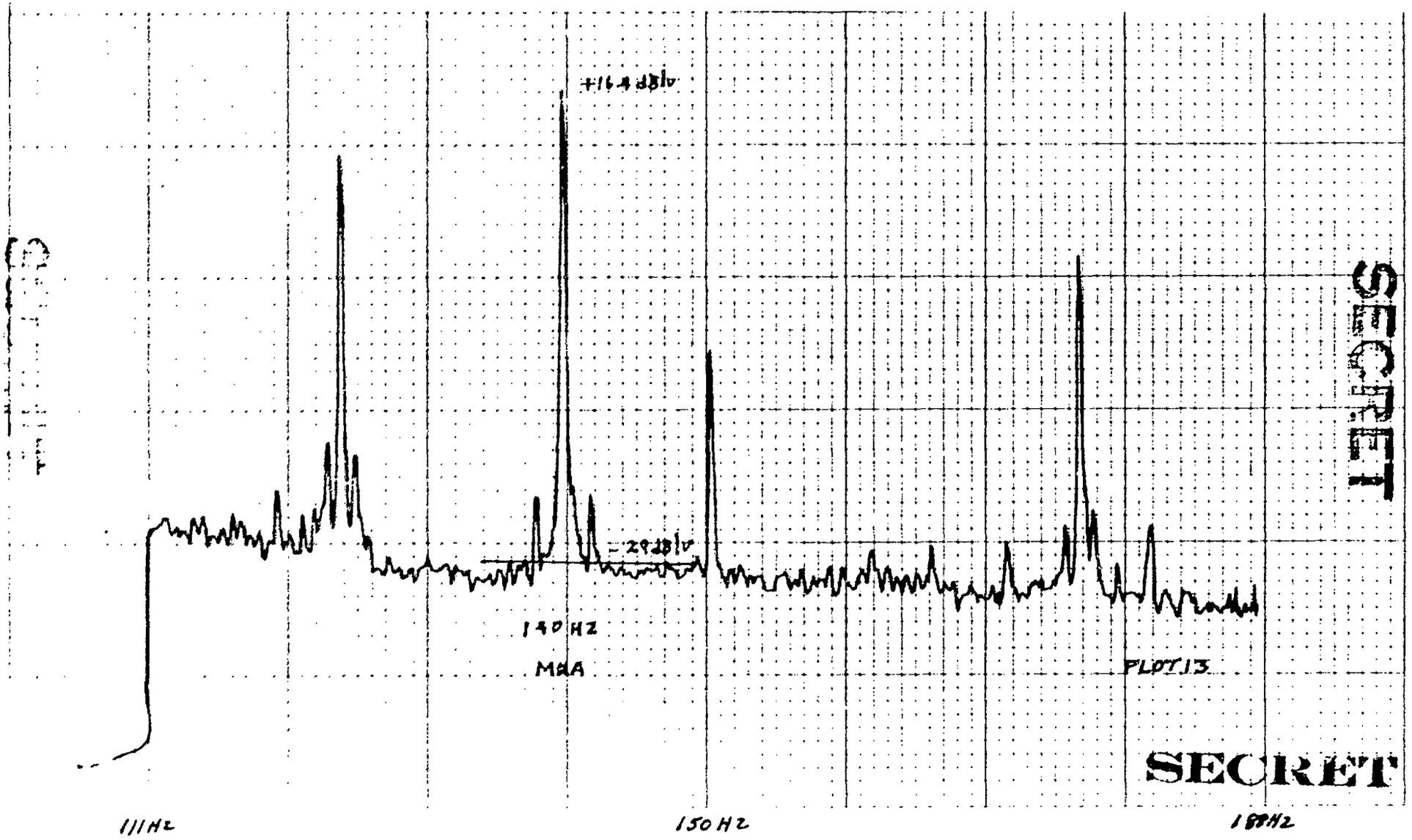
SECRET

CONTROL: 2131 - 51 (DD9)
BEAMFORMED SPECTRUM(ELEMENTS 17-26 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: __ __ __
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51.5 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3630
ATTEN: - DB



SECRET

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

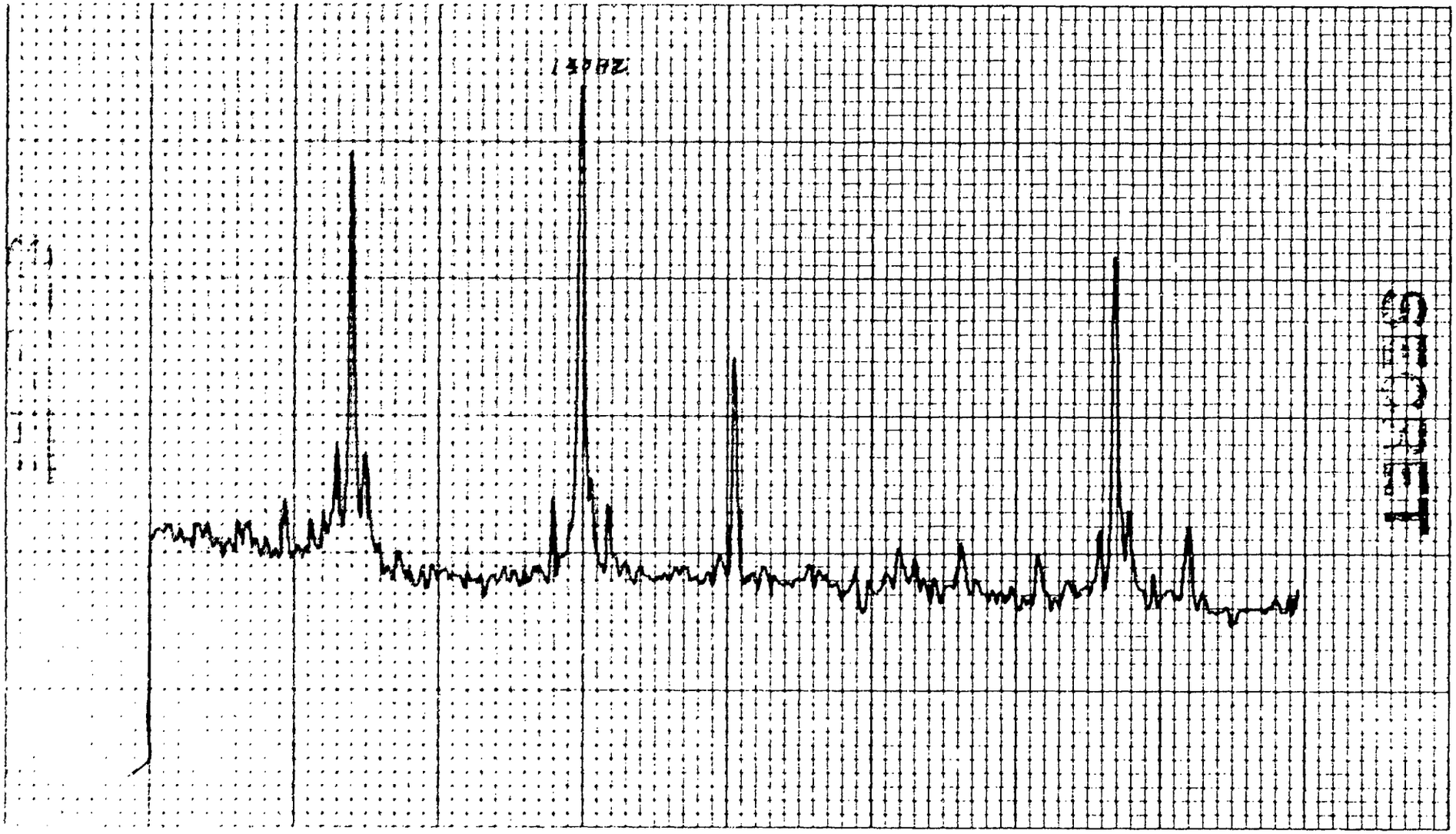
1.

CONTROL: 2131 - 51 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 7-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3630
ATTEN: -30 DB



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 51 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 + 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 7-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -30 DB

K+E 10 X 10 TO THE HALF INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 51 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: M10

INTEGRATION TIME 320 SECS

INDEX 3620

ATTEN: -3 DB
FILTER WTG: HANNING

K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 231 - 51 (DPQ)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -30 DB

K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

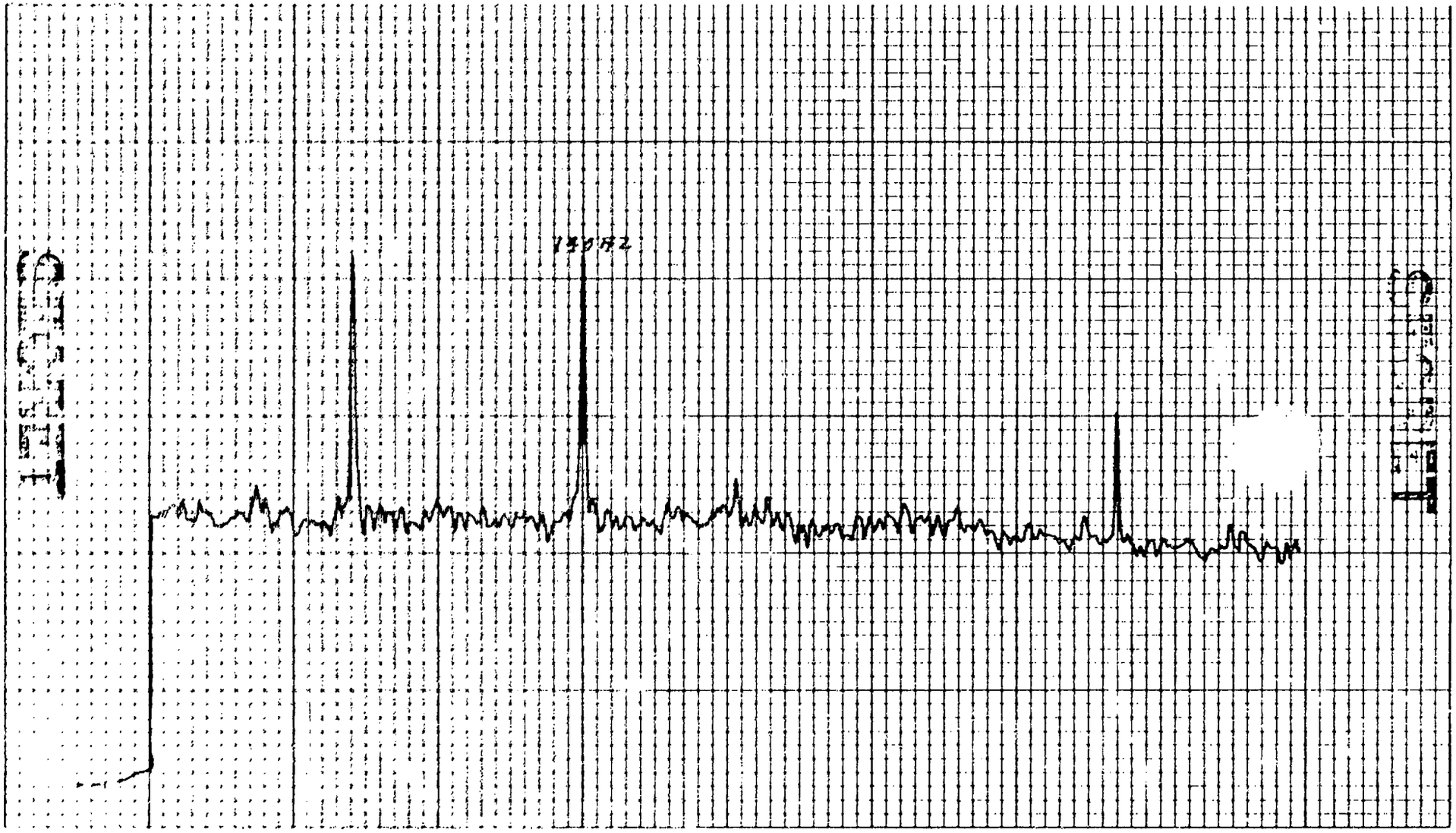
46 0703

CONTROL: 2131 - 51 (DPG)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 150 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-5-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M10
INDEX 3620

INTEGRATION TIME 320 SECS
ATTEN: -70DB
FILTER WTG: HANNING



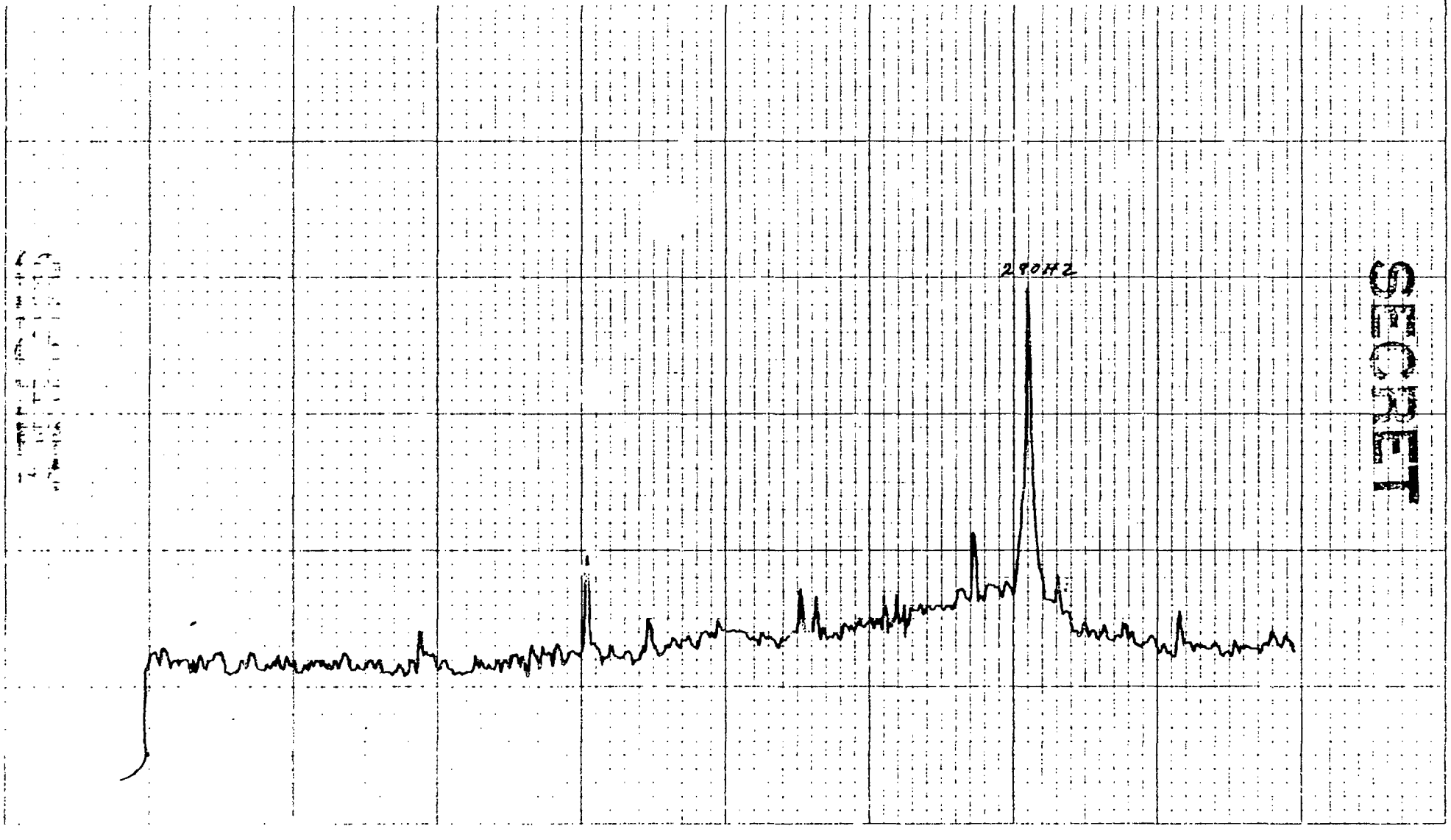
46 0703

CONTROL: 2131 - 51 (BPP)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2:31 Z
ANALYSIS BANDWIDTH: 1/10HZ
+44 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -30 DB



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 51 (DPP)
BEAMFORMED SPECTRUM/ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
1-26 & 29-53)
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+46 DEG. AZ STEERING

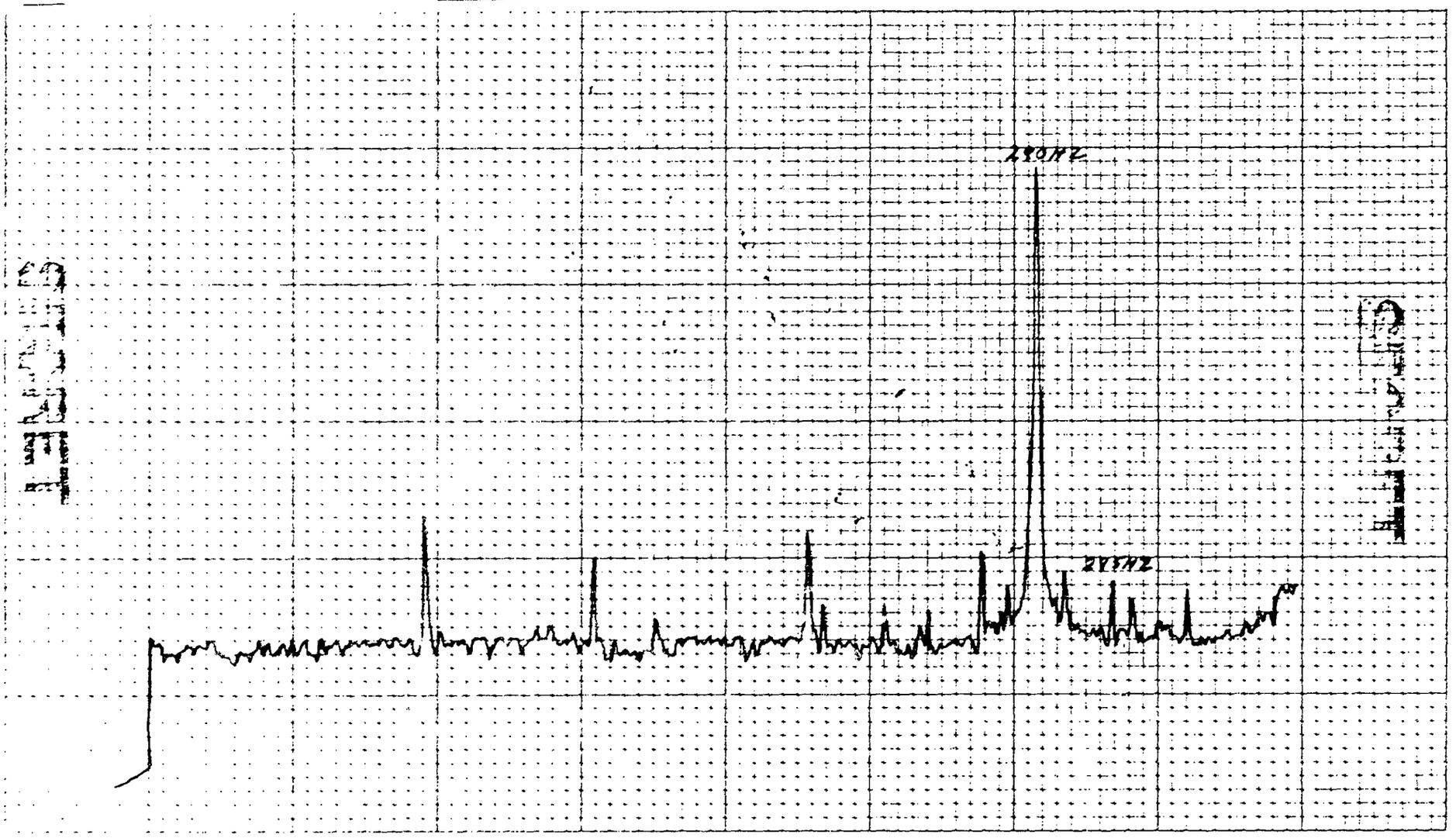
REEL: M10

INDEX 3620

INTEGRATION TIME 320 SECS

ATTEN: -30 DB

FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

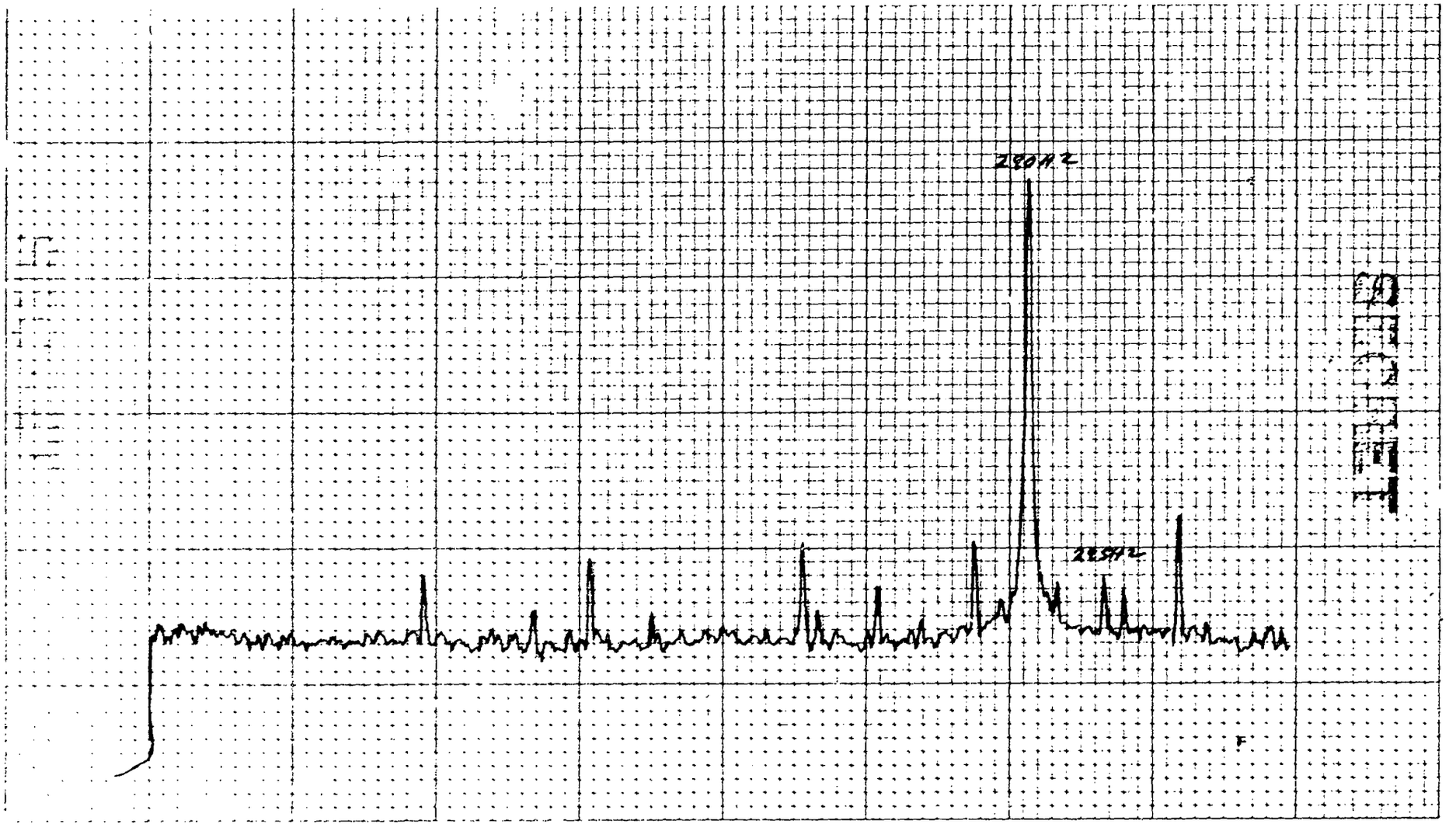
46 0703

CONTROL: 2131 - 51 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+46 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -30 DB



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

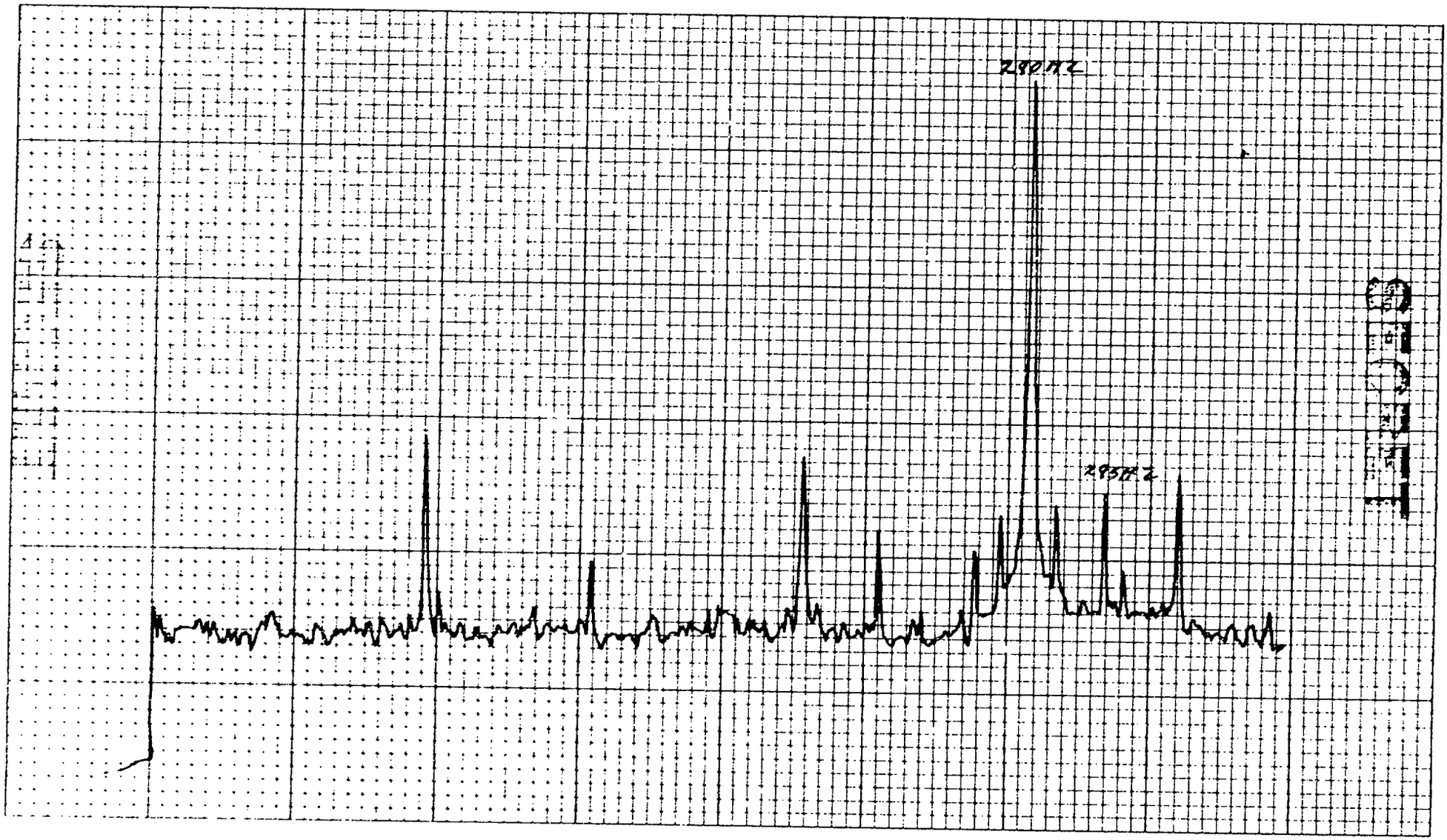
46 0703

CONTROL: 2131 - 51 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+50 DEG. AZ STEERING

REEL: 410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -30 DB



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

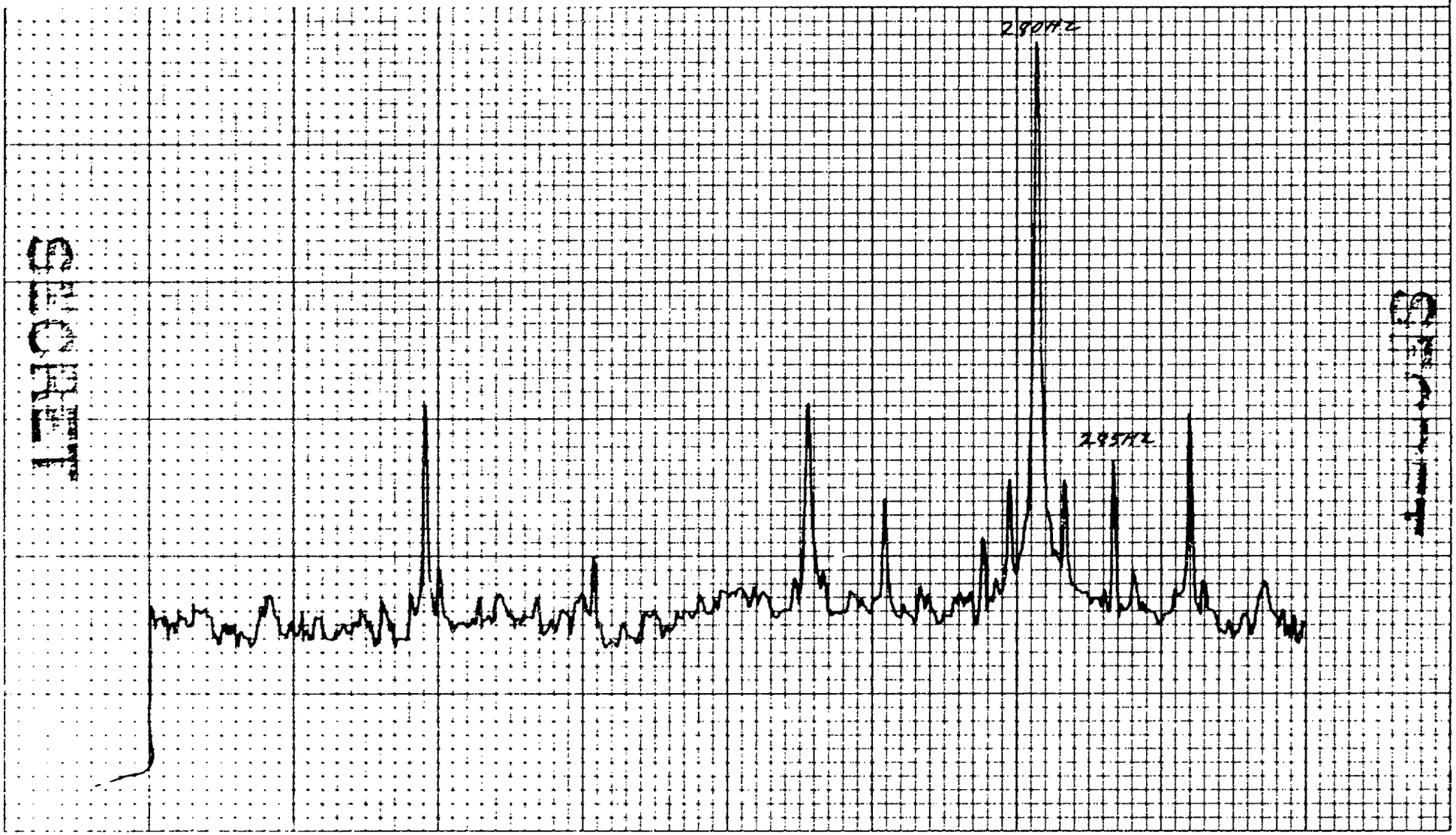
46 0703

CONTROL: 2131 - 51 (DPQ)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — — —
DATE/TIME: 3-15-77 - 2151 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51 DEG. AZ STEERING

REEL: 1410
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3626
ATTEN: -30DB



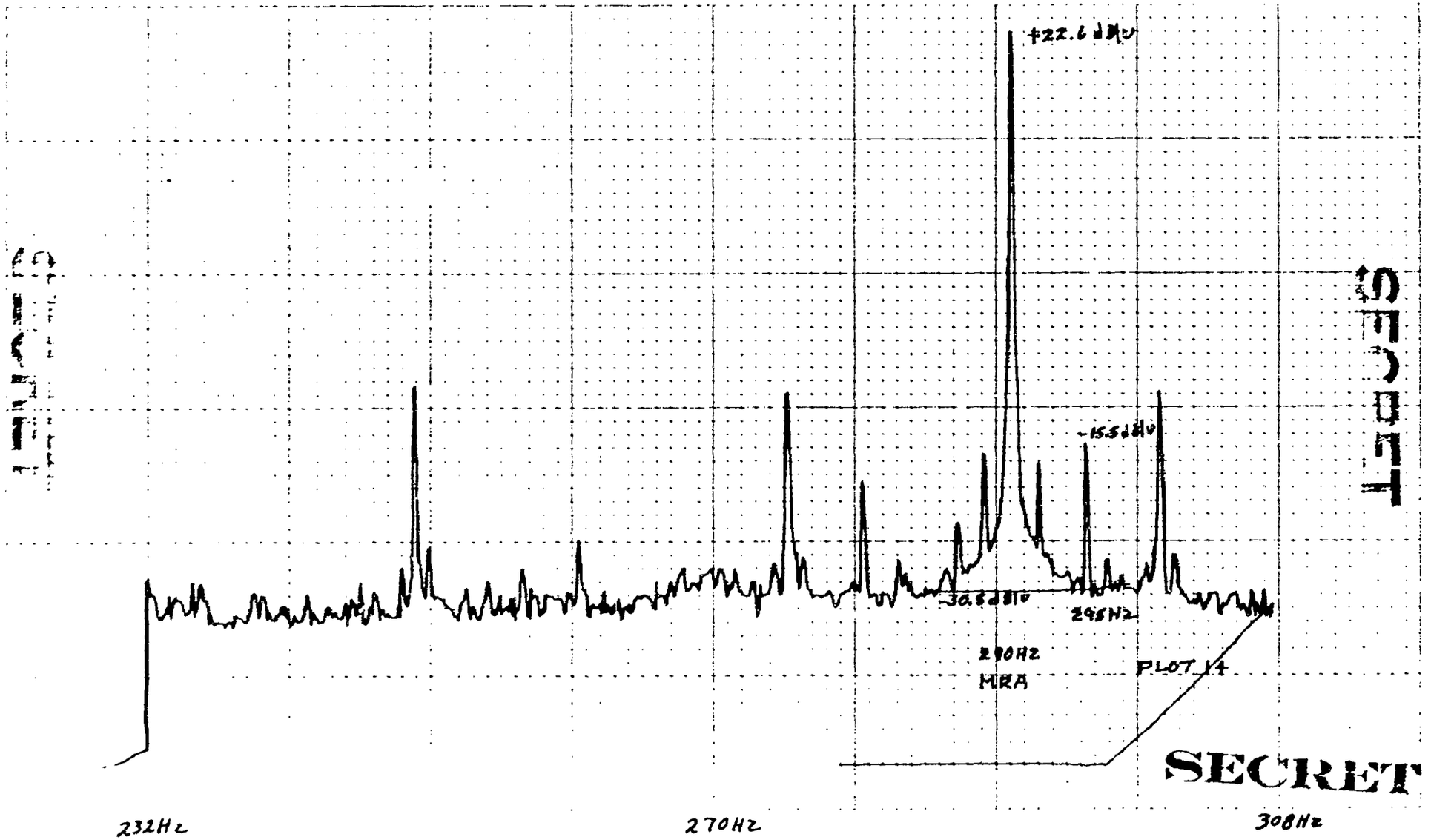
46 0703

SECRET

CONTROL: 2131 - 51 (DPG)
BEAMFORMED SPECTRUM(ELEMENTS 1 TO 26 29 TO 53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: __ ___ __
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+51.5 DEG. AZ STEERING

REEL: M10
INDEX 3630
INTEGRATION TIME 320 SECS
ATTEN: - DB
FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 51 (DPG)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131Z
ANALYSIS BANDWIDTH: 1/10HZ
+52 DEG. AZ STEERING

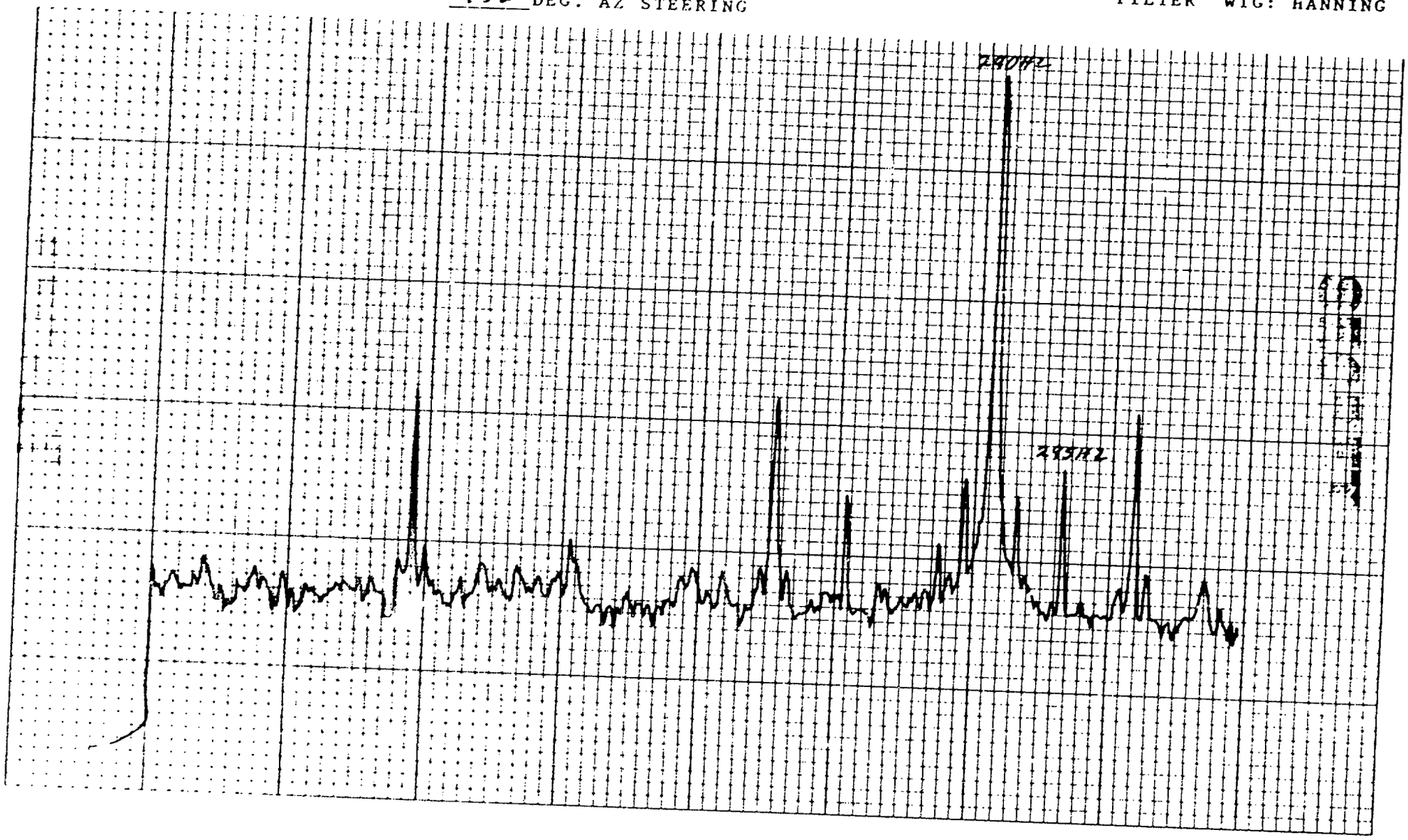
REEL: M10

INDEX 3620

INTEGRATION TIME 320 SECS

ATTEN: -30 DB

FILTER WTG: HANNING



K•E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 51 (DPP)
BEAMFORMED SPECTRUM(ELEMENTS
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: 1-26 & 28-53
DATE/TIME: 7-15-77 - 2121 Z
ANALYSIS BANDWIDTH: 1/10HZ
+54 DEG. AZ STEERING

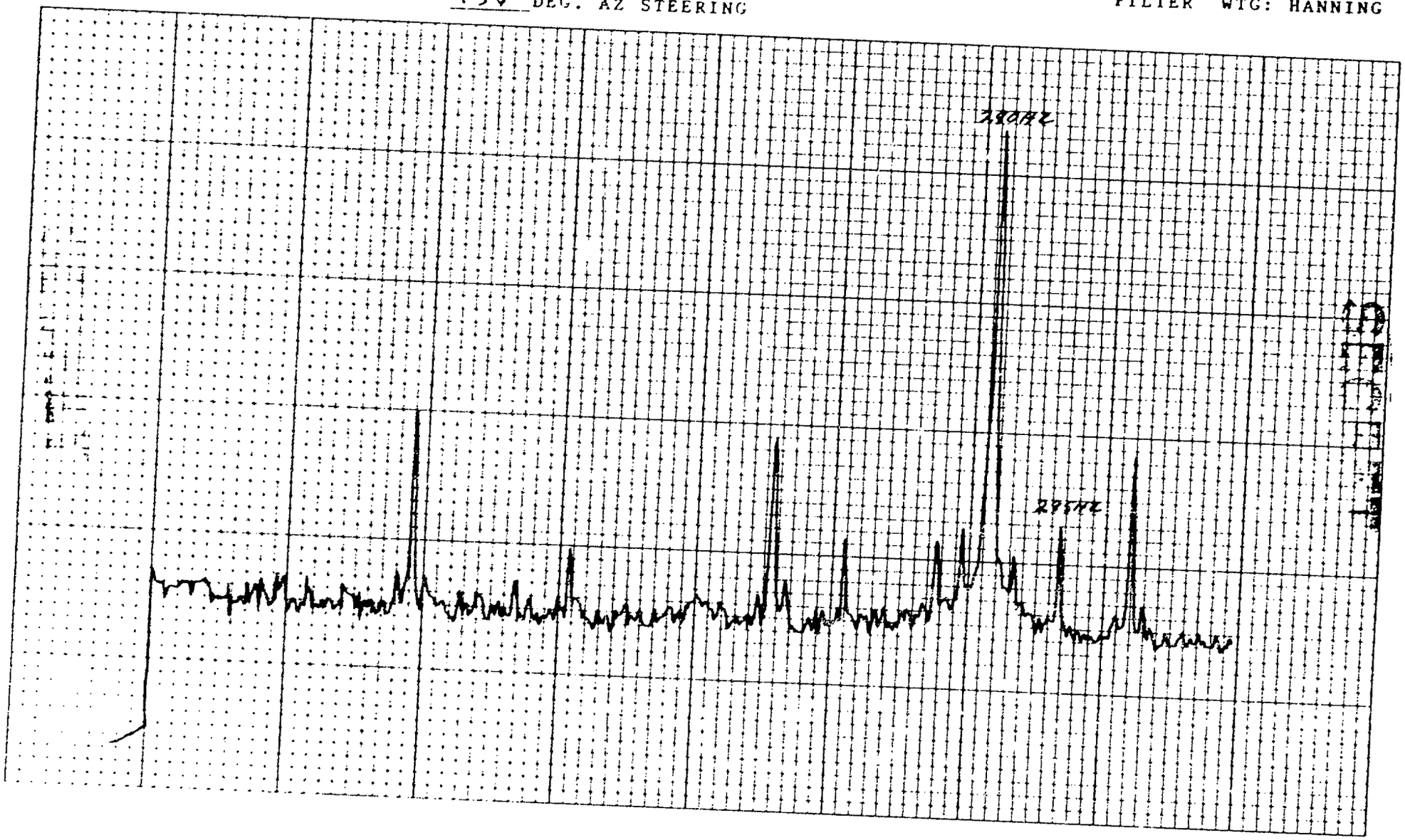
REEL: 1810

INDEX 3620

INTEGRATION TIME 320 SECS

ATTEN: -30 DB

FILTER WTG: HANNING



K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 51 (DP9)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 28-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+56 DEG. AZ STEERING

REEL: 1410
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: -20 DB
FILTER WTG: HANNING

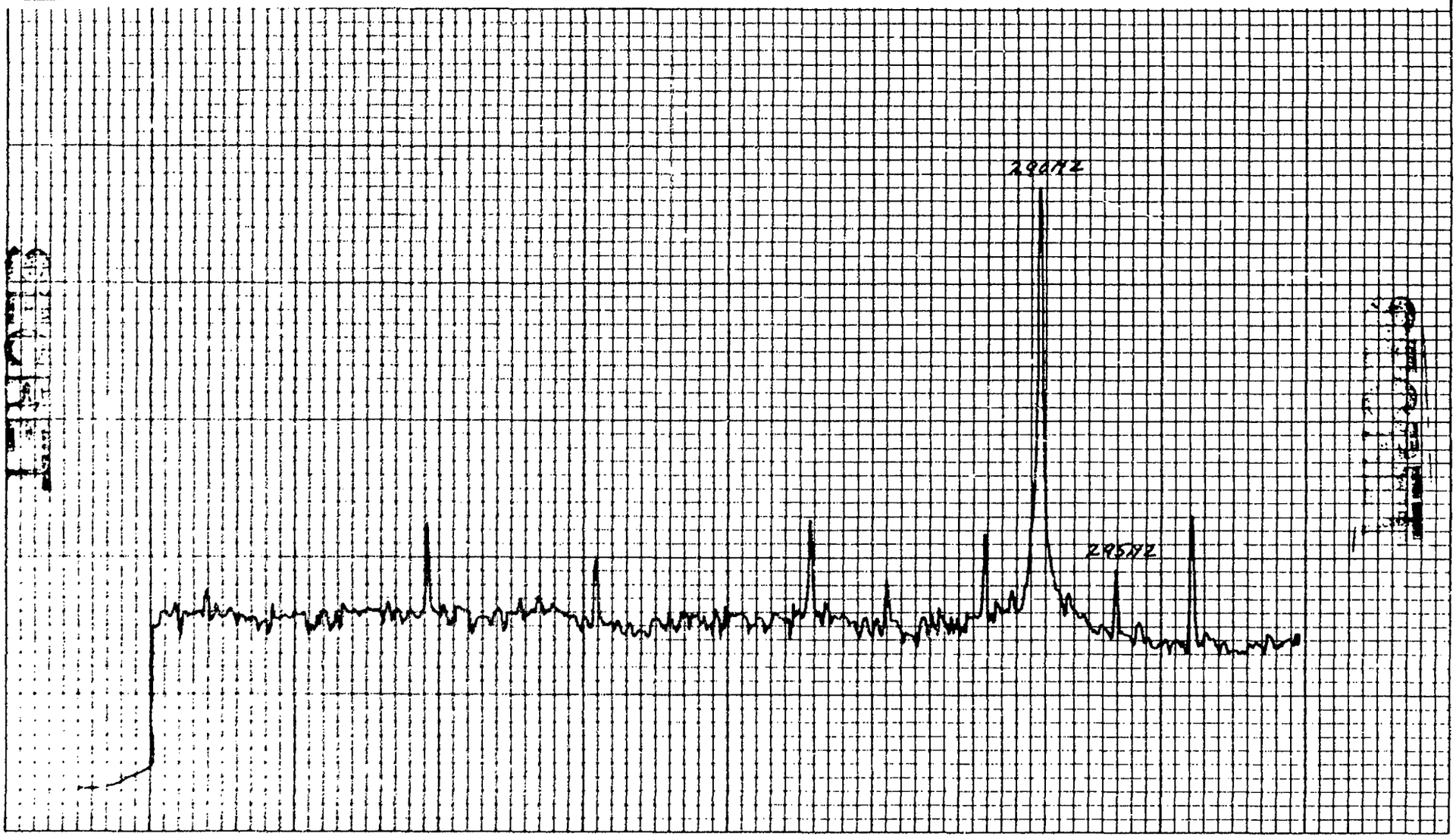
K·E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO. MADE IN U.S.A.

46 0703

CONTROL: 2131 - 51 (DPG)
BEAMFORMED SPECTRUM(ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: — - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+58 DEG. AZ STEERING

REEL: M10
INDEX 3620
INTEGRATION TIME 320 SECS
ATTEN: -30 DB
FILTER WTG: HANNING



K+E 10 X 10 TO THE INCH • 7 X 10 INCHES KEUFFEL & ESSER CO.

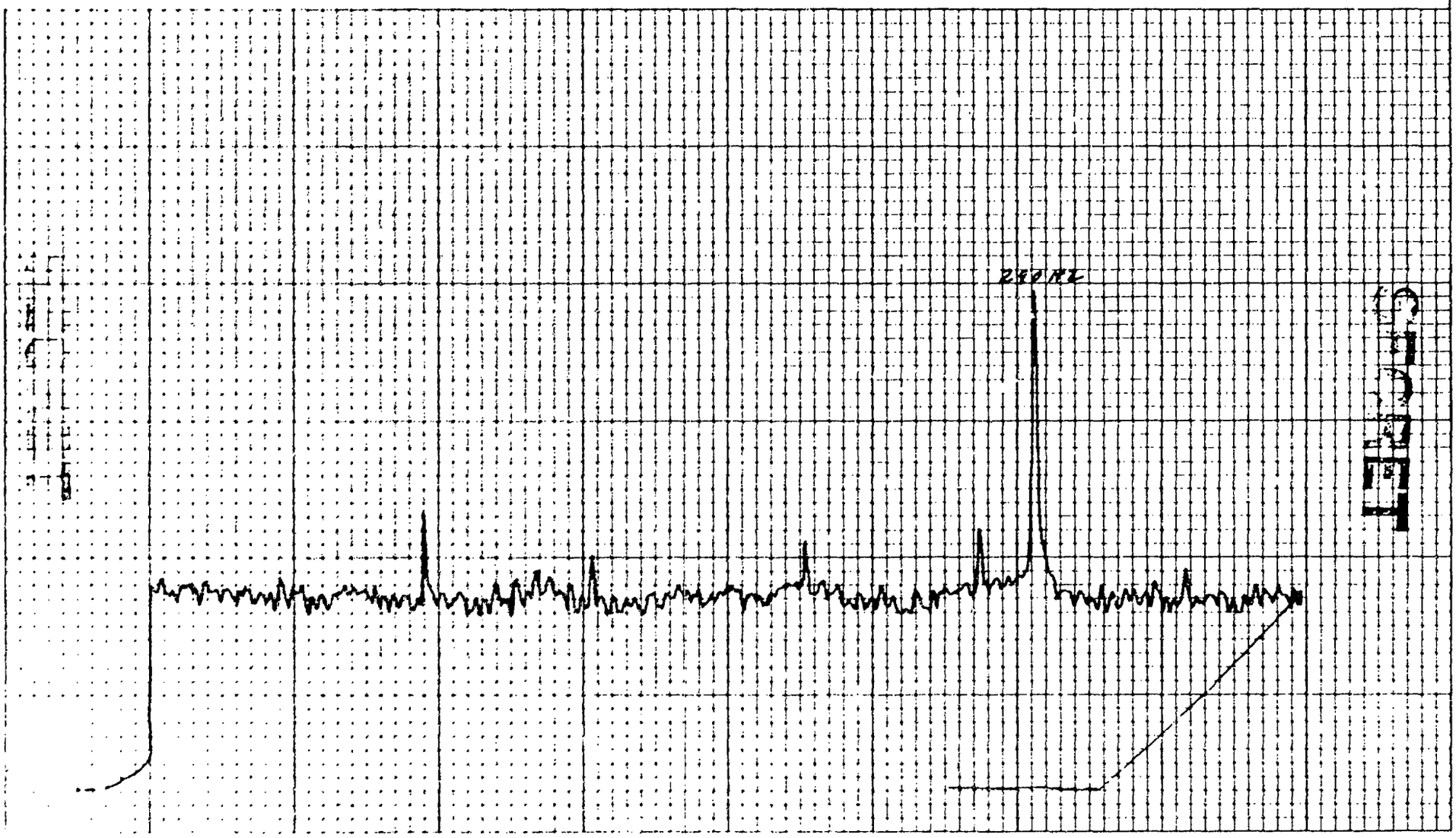
46 0703

CONTROL: 2131 - 51 (DP9)
BEAMFORMED SPECTRUM (ELEMENTS 1-26 & 29-53)
EXERCISE: BEARING STAKE
CENTER FREQ: 270 HZ
51 ELEMENTS

DATE OF ANALYSIS: - - -
DATE/TIME: 3-15-77 - 2131 Z
ANALYSIS BANDWIDTH: 1/10HZ
+60 DEG. AZ STEERING

REEL: M10
INTEGRATION TIME 320 SECS
FILTER WTG: HANNING

INDEX 3620
ATTEN: -30 DB



DEPARTMENT OF THE NAVY
OFFICE OF NAVAL RESEARCH
875 NORTH RANDOLPH STREET
SUITE 1425
ARLINGTON VA 22203-1995

IN REPLY REFER TO:

5510/1
Ser 321OA/011/06
31 Jan 06

MEMORANDUM FOR DISTRIBUTION LIST

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT (LRAPP) DOCUMENTS

Ref: (a) SECNAVINST 5510.36

Encl: (1) List of DECLASSIFIED LRAPP Documents

1. In accordance with reference (a), a declassification review has been conducted on a number of classified LRAPP documents.

2. The LRAPP documents listed in enclosure (1) have been downgraded to UNCLASSIFIED and have been approved for public release. These documents should be remarked as follows:

   Classification changed to UNCLASSIFIED by authority of the Chief of Naval Operations (N772) letter N772A/6U875630, 20 January 2006.

   DISTRIBUTION STATEMENT A: Approved for Public Release; Distribution is unlimited.

3. Questions may be directed to the undersigned on (703) 696-4619, DSN 426-4619.

BRIAN LINK
By direction

Subj: DECLASSIFICATION OF LONG RANGE ACOUSTIC PROPAGATION PROJECT (LRAPP) DOCUMENTS

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Declassified LRAPP Documents

Report Number	Personal Author	Title	Publication Source (Originator)	Pub. Date	Current Availability	Class.
Unavailable	Bossard, David C.	ACOUSTIC ANALYSIS/ASEPS	Wagner Associates	780726	ADA076268	U
NRLMR3832	Heitmeyer, R., et al.	PRELIMINARY RESULTS OF AN ANALYSIS OF BEAM NOISE IN THE MEDITERRANEAN (U)	Naval Research Laboratory	780901	ND ADC016220	U
Unavailable	Watrous, B. A.	PARKA 1 OCEANOGRAPHIC DATA COMPENDIUM	Naval Ocean R&D Activity	781101	ADB115967	U
Unavailable	Dunbar, B., et al.	LAMBDA PROCESSING LABORATORY AND ENGINEERING SUPPORT, FINAL REPORT 1 JANUARY 1977 - 31 OCTOBER 1978	Texas Instruments, Inc.	781129	ND	U
Unavailable	Blumen, L. S., et al.	ASTRAL MODEL. VOLUME 2: SOFTWARE IMPLEMENTATION	Science Applications, Inc.	790101	ADA956122	U
Unavailable	Spofford, C. W.	ASTRAL MODEL. VOLUME 1: TECHNICAL DESCRIPTION	Science Applications, Inc.	790101	ADA956124	U
Unavailable	Townsend, R., et al.	SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS. FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1977. VOLUME IA. OVERALL PROGRAM PERFORMANCE RESULTS WITH TEST RESULTS SUMMARY	Sanders Associates, Inc.	790101	ADC017573	U
Unavailable	Unavailable	SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS. FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1977. VOLUME IB. DETAILED DESCRIPTION, TEST RESULTS	Sanders Associates, Inc.	790101	ADC017574	U
Unavailable	Unavailable	SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS. FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1977. VOLUME II. DATA ANALYSIS FACILITY AND DATA REDUCTION METHODOLOGY	Sanders Associates, Inc.	790109	ADC017575	U
Unavailable	Unavailable	SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS. FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1977. VOLUME IIIA. DATA POINTS 1, 2 AND 3 RAW DATA	Sanders Associates, Inc.	790109	ADC017576	U
Unavailable	Unavailable	SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS. FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1977. VOLUME IIIB. DATA POINTS 4, 5 AND 6 RAW DATA	Sanders Associates, Inc.	790109	ADC017577	U
Unavailable	Unavailable	SELF-TENSIONING ACOUSTICAL HORIZONTAL LINE ARRAY (SPRAY) DATA ANALYSIS. FINAL REPORT OF BEARING STAKE TESTS JANUARY THRU MARCH 1977. VOLUME IVA. DATA POINTS 7, 8 AND 9 RAW DATA	Sanders Associates, Inc.	790109	ADC017578	U